

PRODUCT SALES

<u>UNITS</u>	12 MOS	12 MOS	6 MOS	<u>TOTAL</u>
	<u>6/92</u>	<u>6/93</u>	<u>12/93</u>	
A500/A600/1200	940,000	740,000	190,000	1,870,000
A2000/A3000/A4000	70,000	45,000	16,000	131,000
CD32	-	-	75,000	75,000

REVENUES (\$ MILLIONS)

A500/A600/A1200	\$ 350	\$ 220	\$ 55
A2000/A3000/A4000	80	60	25
CD32	-	-	25
PERIPHERALS	145	70	30
TOTAL AMIGA	575	350	135
PCS	220	220	15
C64 GROUP	115	20	-
GRAND TOTAL	\$ 910	\$ 590	\$ 150

GEOGRAPHIC SALES

	<u>12 MOS</u> <u>6/92</u>	<u>12 MOS</u> <u>6/93</u>	<u>6 MOS</u> <u>12/93</u>
<u>(\$ MILLION)</u>			
GERMANY	\$ 293	\$ 96	\$ 35
UNITED KINGDOM	147	112	45
FRANCE	77	72	12
ITALY	75	55	10
OTHER EUROPE	206	160	22
SUBTOTAL EUROPE	<u>798</u>	<u>495</u>	<u>124</u>
U.S./CANADA	77	63	19
AUSTRALIA	<u>35</u>	<u>32</u>	<u>7</u>
TOTAL	<u>\$ 910</u>	<u>\$ 590</u>	<u>\$ 150</u>
DM EXCHANGE RATE	1.64	1.55	1.67

PRICING TREND

	<u>3 MOS</u> <u>12/91</u>	<u>3 MOS</u> <u>12/92</u>	<u>3 MOS</u> <u>12/93</u>
A500	379	252	122
A600	-	285	191
A1200	-	389	292
A2000	842	661	-
A3000	2,335	1,480	-
A4000/040	-	1,815	1,659
1084	254	221	172

□ ***APPLICATIONS / USERS BREAKDOWN***

Applications	US 40%	Europe 60%
Video Toaster	70%	5%
Home Computer Upgrades	5%	30%
Multimedia (Games) Development System	0%	15%
Standard PC Productivity	5%	10%
Non-Video Toaster Video and Image Processing	15%	25%
Embedded Applications, i.e. Kiosk, CCTV, Medical, etc.	5%	15%

AMIGA 1200 SPECIFICATIONS

Microprocessor	<ul style="list-style-type: none">• Motorola® 32-bit 68EC020 @ 14 MHz, 256-byte instruction cache, 3.5 MIPS performance
Memory	<ul style="list-style-type: none">• 2 MB of DRAM (512K x 32 bit organization), 70 ns access time• 512 KB of 100 ns access time ROM containing AmigaDOS 3.0
Disk Drives	<ul style="list-style-type: none">• 3.5-inch 880 KB floppy drive• Optional internal 2.5-inch IDE hard drive• External floppy disk drive port
General Purpose Ports	<ul style="list-style-type: none">• Two mouse/joystick ports (support Amiga mouse, game joysticks, light pens, track balls, other controllers)• Serial port (RS-232)• Parallel port (supports standard Centronics® printers)• Standard PCMCIA 2.0 slot
Video Ports	<ul style="list-style-type: none">• RF modulator port (antenna connection)• Composite video port• RGB video
Audio Ports	<ul style="list-style-type: none">• Stereo line out (right and left)• Monaural audio in RF modulator port• Amiga audio: stereo 8-bit PCM 4-voice audio
Amiga Custom Chipset Video Capabilities	<ul style="list-style-type: none">• Programmable screen resolutions and raster timing<ul style="list-style-type: none">- Maximum of 1448 pixels/line x 482 lines in NTSC 15 KHz modes- VGA and SVGA to 800 x 600 resolutions (with optional RGB adapter)- NTSC/PAL compatible- CCIR 601 studio-quality video- 35 ns pixels (Super High Resolution mode)- Programmable overscan• Hardware de-interlacing and scan line doubling• Hardware vertical and horizontal scrolling on two independent playfield screens• Hardware panning on 16,384 x 16,384 pixel images• Eight sprites (16, 32, or 64 pixels wide x n pixels high)• Attachable sprites• Sprite collision detection in hardware• 24-bit color palette (16.8 million colors)• Dynamically updatable palette (on a scan line basis)• 8 bitplanes supporting 256 colors from a palette of 16.8 million colors

**Amiga Custom
Chipset Video
Capabilities
(cont'd)**

- Hold and Modify mode supporting screens of over 256,000 colors from a palette of 16.8 million colors
- Two video accelerator coprocessors
 - High performance BLITTER
 - Block moves
 - Line drawing
 - Area fills
 - 256 operations from three sources to one destination
 - Video coprocessor
 - Independent coprocessor for control of video and audio systems
 - Allows video control synchronous with beam position
 - Genlock Input support for video overlays from MPEG-1

**Bus Expansion
Connector Port**

- Supports one internal expansion board
- 150-pin local bus edge connector
- High-speed 32-bit RAM expansion
- Coprocessor expansion
- CPU accelerators
- RAM / ROM expansion to 12 MB supported

Power

- External AC adapter (either 110V or 220/240V)
- 23 watts

Size

- 3" H x 18.5" D x 9.5" W

Weight

- 8 lb.

**Operating
System**

- AmigaDOS 3.0, a powerful, eighth-generation, preemptively multitasking operating system that is 100% compatible with all Amiga systems

**Development
Environment**

- Amiga 4000 system and tools

Amiga Chips

FG		Wafer
Generic		
Lisa	20000	HP/NCR? <i>95K</i>
Alice	66000	331000
Paula	97000	635000
A1200		
AA_Gayle	65000	79000
Budgie	9500	VLSI?
2x8520R	207000	258000
KB_MPU	32000	Motorola?
CD32		
Akiko	1000	VLSI?
A4000/A4000T		
Super_Buster	9000	13000
Fat_Gary	8000	9000
Ramsey	8000	18000
Bridget	2000	NCR(4K)?
2x8520A	22000	
8520_Rev?		13000

Key FG Components

A1200		PSU	6000
		Keyboard	4000
		Casework/Shields	4000
		Floppy Drive	
CD32		PSU	4500
		CD_Mech	40000
		Casework/Shields	12000
		Game Controller	650
A4000		PSU	600
		Casework	200
		Floppy	300
		Keyboard	
A4000T		PSU	Standard
		Casework	Standard
		Floppy	Try Standard
		Keyboard	Try Standard
		SCSI Chip	Standard

Deliverables

Enabling Technology (ECS, AA, AAA, RISC3D Chips)

Note - All Items below are in electronic format

- (1) Schematics
- (2) Device Layout or Synthesis Input (if relevant)
- (3) Design Rules
- (4) Test Vectors
- (5) Simulation Data
- (6) Design Tools

Enabling Technology (ASICs)

Note - All Items below are in electronic format

- (1) Schematics
- (2) ASIC Library Reference
- (3) Test Vectors or Vector Synthesis Input
- (4) ASIC Tools

Software Technology

Note - All Items below are in electronic format

- (1) Source Code Files
- (2) Binary Files
- (3) Make Files
- (4) Documentation
- (5) Software Tools

System/Hardware Technology

Note - All items below reside in Document Control(1&2 electronic also)

- (1) Schematics
- (2) PCB Artwork
- (3) Hierarchal Drawing Trees
- (4) Bill of Materials (BOM) for each Assembly
- (5) Component Specifications & Approved Vendor List (AVL)
- (6) Mechanical Detail & Assembly Drawings

Manufacturing Technology

- (1) Test Procedures
- (2) Test Software (Source & Executables)
- (3) Functional Test Fixture Design
- (4) Tooling

TOOLING

- A1200

Description	Part Number	Location
Top Case:	P/N 364914	Plastimer(Phil)
Bottom Case:	P/N 364913	"
Expansion Port:	P/N 364084/5	"
RAM Expansion:	P/N 365015	"
Top Shield:	P/N 364911	Heng Meng(Phil)
Bottom Shield:	P/N 364910	" "
FDD Support:	P/N 364982	" "
HDD Support:	P/N 364983	" "

- A4000 and A4000CR

Description	Part Number	Location
Chassis:	P/N 363851	Cheng Fwa(Taiwan)
Front Bezel:	P/N 364073	Plastimer(Phil)
Cover:	P/N 363850	Cheng Fwa
Option Bracket:	P/N 364859	"
Chassis Brace:	P/N 363818	"
Port Bracket:	P/N 364454	"
FDD Bracket:	P/N 364206	"
Cover Plate:	P/N 364465	"
HDD R/L:	P/N 363819/01/02	Wangtex(Taiwan)
Power Button:	P/N 363830	Plastimer(Phil)
5.25 Cover:	P/N 364904	"
3.5 Cover:	P/N 364239	"

- A4000T

Front Bezel:	P/N 365312	Enlight(Taiwan)
Bezel Door:	P/N 365310	"
Door Window:	P/N 365309	"
Disk Bracket:	P/N 365347	"
Video Bracket:	P/N 365348	"

- CD32

Description	Part Number	Location
Top Case (C):	P/N 365196	Ambo Plastics(Taiwan)
Top Case (P):	P/N 365420	"
Bottom Case:	P/N 365195	"
ExpansionCover:	P/N 365193	"
Volume Button:	P/N 365218	"
Reset Button:	P/N 365219	"
Lid:	P/N 365170	"
Retain Ring (C):	P/N 365234	General Mechanical(HK)
Retain Ring (P):	P/N 365419	" "
View Window:	P/N 365215	Cheng Feng(Taiwan)
Top Shield:	P/N 365167	General Mechanical(HK)
Bottom Shield:	P/N 365166	" "
Lid Spring:	P/N 365200	" "
Pivot Arm:	P/N 365201	" "
Pivot Base:	P/N 365203	" "
Hinge Pin:	P/N 365171	" "

- MPEG

Description	Part Number	Location
Top Shield:	P/N 365424	Heng Meng(Phil)
Bottom Shield:	P/N 365425	" "
Cap Shield:	P/N 365423	" "
Rear Cover:	P/N 365440	Sangent(Taiwan)

- A500

Description	Part Number	Location
Top Case:	P/N 312505	Plastimer(Phil)
Bottom Case:	P/N 312506	"
Top Shield:	P/N 312504/358	Heng Meng(Phil)
Bottom Shield:	P/N 312590	" "
RAM Door:	P/N 312591	Plastimer(Phil)
EXP Cover:	P/N 312595	Plastimer(Phil)

- A600

Description	Part Number	Location
Top Case:	P/N 363786	Plastimer(Phil)
Bottom Case:	P/N 363787	"
Top Shield:	P/N 363788	Heng Meng(Phil)
Bottom Shield:	P/N 363789	" "
RAM Door:	P/N 363899	Plastimer(Phil)

- C-64C and Original 64

Description	Part Number	Location
Top Case:	P/N 252110	Magnetics(China)
Bottom Case:	P/N 252111	"
Top Shield:	P/N 252114	"
Bottom Shield:	P/N 251976	"
Metal Angle RT:	P/N 252113	"
Metal Angle LT:	P/N 252450	"
Top Cover:	P/N 326113 (OLD)	
64 Base:	P/N 326114 (OLD)	
Top Shield	P/N 332360 (OLD)	

TOOLING SUPPLIERS

Hong Kong

General Mechanical
Winner Factory Building
B.C. 9th Floor
55 Hung Tong
Kowloon, Hong Kong

China

Magnetics
18-22 Lam Tin Street
Kwai Chung, N.T.
Hong Kong

852-487-5211

Philippines

Plastimer
25 T. Santiago Street
130 Canumay, Velenzuel
Philippines

63-2-292-7901

Heng Meng
100 Marcos Alvarez Avenue
Las Pinas
Metro Manila
Philippines

63-802-0716

Constant Packaging Corp
Mansamang D.C.
Metro Manila
Hong Kong

FAX 63-34-5467

Eastern Sources Electronic
Rm 16/17 5/F Cardinal Industrial Bldg
No 17 On Luk Mun St
Panling, New Territories

FAX 852-677-4592

Taiwan

Ambo Plastics
12-2/FL 45 Chung Hsiao W. Road
Sec 1, Taipei, Taiwan R.O.C.

FAX-2-361-9250

Cheng Feng
No. 29 Alley 7, Lane 1 Feng Road
Tu Cheng Hsiao, Taipei, Taiwan R.O.C.

Shangent
10F, 111-34, Sec 4 San
San Chung City, Taipei, Taiwan R.O.C.

Cheng Fwa
25, Kuang Fu Road
Sec 2, San Chung, Taipei, Taiwan R.O.C.

Wingtex
69 Chung Shan Road
Tu-Ind. District Pei Po T
Cheng Taipei, Taiwan R.O.C.

Acry
No 28 Alley 7 Lane 195
Yun Feng Road
Tu Cheng City Taipei Hsien

FAX - 886 - 2 - 265 - 0892

Germany

Star Germany
w-7030 Bablingen
Herrschaftsgartenstr 8/1

FAX 49-7031-227.200

USA

Acorn Press
Litiz, PA

717-569-3264

Technology & Intellectual Property

Technology & Intellectual Property

- (1) Patents & Trademarks
- (2) Amiga System Designs
 - Engineering Documentation
 - Supporting ASIC's (Application Specific IC's)
 - Expertise
- (3) Amiga System Software
 - Documentation, Source Code, Binaries,
 - Kernal, User Interface, DOS, Kickstart
- (4) Amiga ECS Chipset (16bit)
 - Specifications, Schematics, Test Vectors
- (5) Amiga AA Chipset (32bit)
 - Specifications, Schematics, Test Vectors
- (6) Amiga AAA Chipset
 - Specifications, Schematics, Test Vectors
- (7) RISC/3D (Hombre)
 - Specifications, Block diagrams, Simulations
- (8) C64/C65
 - Engineering Documentation
- (9) Amiga Vision Multimedia Authoring Package
 - Source Code, Binaries, Utilities
- (10) CD-ROM Technology
- (11) DSP Technology
- (12) MPEG Technology

Amiga Systems Deliverables

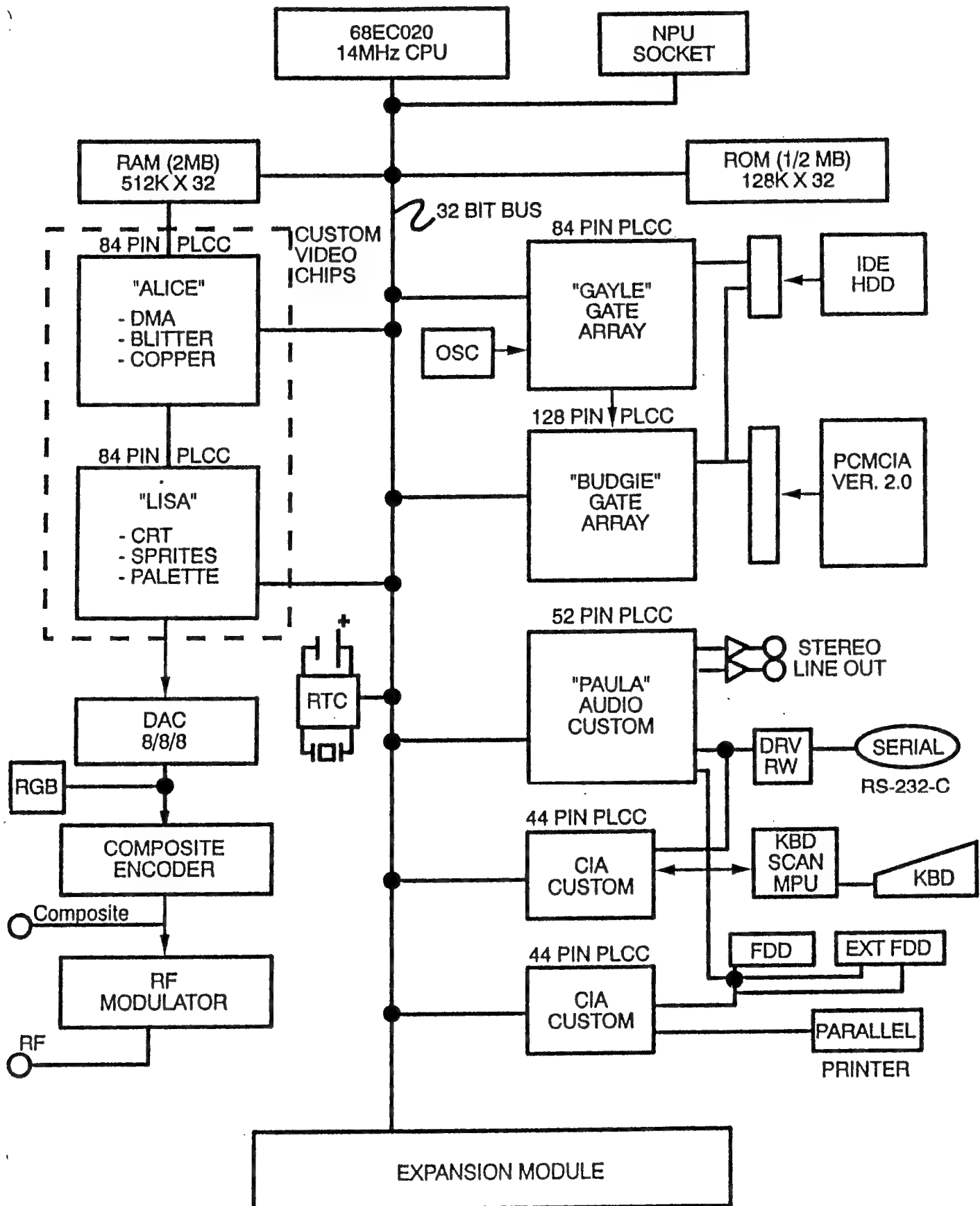
For all products mentioned below there exists a complete manufacturing package known internally as Pilot Production Release. The Pilot Production Release consists of a Hierarchical drawing structure for all aspects of the product design outlined with a drawing tree. These drawings provide a reference to all necessary part numbers and specifications.

For example; The Bill of Material (BOM) for a given products main printed circuit board (PCB) lists each component by part number, designator reference, and description. Given the Commodore part number, one can reference the part specification and approved vendor list (AVL). BOM's exist for each logical assembly within a given product.

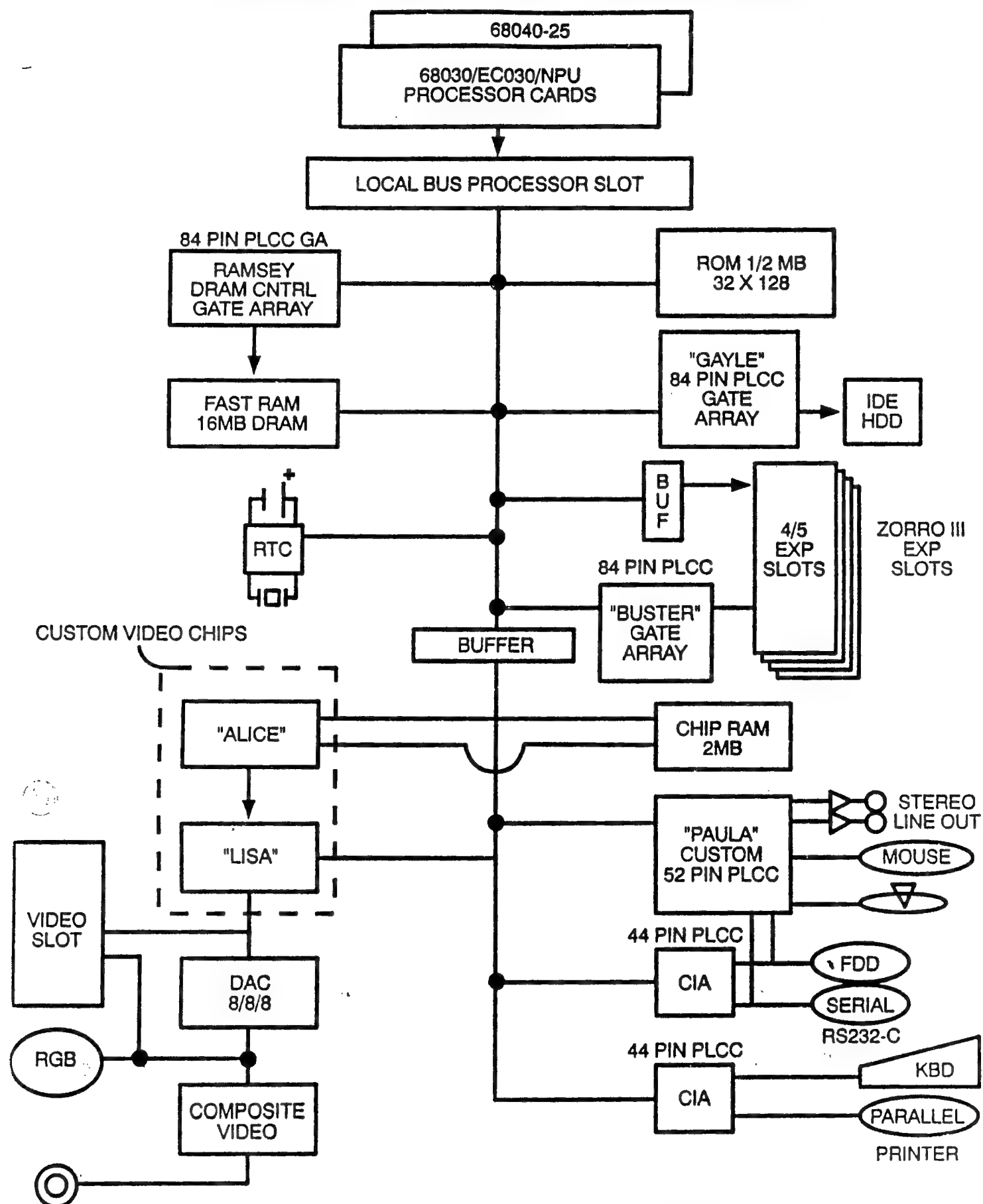
The support products are:

- (1) CD32
- (2) A1200
- (3) A4000
- (4) A4091
- (5) A4000T
- (6) A600
- (7) A500
- (8) A570
- (9) A3000
- (10) A2000
- (11) A2386SX

A1200 BLOCK DIAGRAM



A4000 BLOCK DIAGRAM

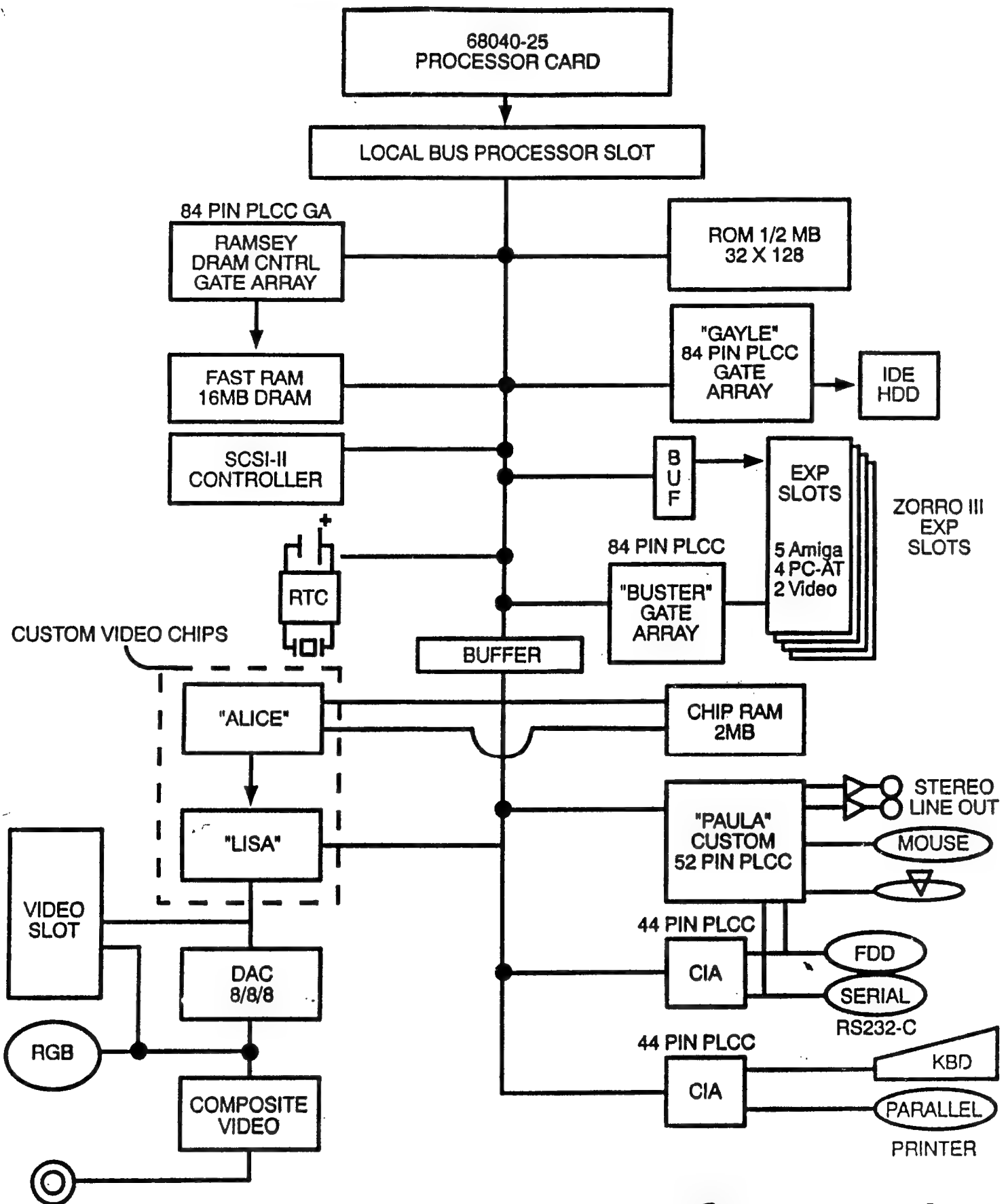


AMIGA 4000 SPECIFICATIONS

- | | |
|--|---|
| Microprocessor | <ul style="list-style-type: none">• Motorola® 32-bit 68040 @ 25 MHz |
| Memory | <ul style="list-style-type: none">• 2 MB of 32-bit Chip RAM• Up to 16 MB of 32-bit Fast RAM on motherboard, easily expandable via SIMMs• 512 KB ROM containing AmigaDOS 3.0 |
| Disk Drives | <ul style="list-style-type: none">• Built-in 3.5-inch high density (880 KB/1.76 KB) floppy drive• Hard drive models pre-formatted and pre-loaded with system software• Directly supports internal IDE hard drives• Two front, 2 rear 3.5-inch drive bays• One front 5.25-inch drive bay |
| Ports | <ul style="list-style-type: none">• Two mouse/joystick ports (support Amiga mouse, game joysticks, light pens, track balls, other controllers)• Keyboard (94 key)• Serial port (RS-232)• Parallel port (supports standard Centronics® printers)• External floppy disk drive port |
| Video Ports | <ul style="list-style-type: none">• RGB video (RGB analog and RGBI digital)• 23-pin to 15-pin adapter for connection to VGA/SVGA monitors included |
| Audio Ports | <ul style="list-style-type: none">• Stereo line out (right and left)• Amiga audio: stereo 8-bit PCM 4-voice audio |
| Amiga Custom Chipset Video Capabilities | <ul style="list-style-type: none">• Programmable screen resolutions and raster timing<ul style="list-style-type: none">- Maximum of 1448 pixels/line x 482 lines in NTSC 15 KHz modes- VGA and SVGA to 800 x 600 resolutions (with optional RGB adapter)- NTSC/PAL compatible- CCIR 601 studio-quality video- 35 ns pixels (Super High Resolution mode)- Programmable overscan• Hardware de-interlacing and scan line doubling• Hardware vertical and horizontal scrolling on two independent playfield screens• Hardware panning on 16,384 x 16,384 pixel images• Eight sprites (16, 32, or 64 pixels wide x n pixels high)• Attachable sprites• Sprite collision detection in hardware• 24-bit color palette (16.8 million colors)• Dynamically updatable palette (on a scan line basis)• 8 bitplanes supporting 256 colors from a palette of 16.8 million colors |

Amiga Custom Chipset Video Capabilities (cont'd)	<ul style="list-style-type: none"> • Hold and Modify mode supporting screens of over 256,000 colors from a palette of 16.8 million colors • Two video accelerator coprocessors <ul style="list-style-type: none"> - High performance BLITTER <ul style="list-style-type: none"> - Block moves - Line drawing - Area fills - 256 operations from three sources to one destination - Video coprocessor <ul style="list-style-type: none"> - Independent coprocessor for control of video and audio systems - Allows video control synchronous with beam position - Genlock input support for video overlays
Bus Expansion	<ul style="list-style-type: none"> • Supports advanced processors and high-speed memory • Four 100-pin Amiga slots with AUTOCONFIG™ • Three PC-AT slots • One extended 24-bit video slot • 200-pin local bus connector
Power	<ul style="list-style-type: none"> • Internal (either 110V or 220/240V), with fan • 150 watts
Size	<ul style="list-style-type: none"> • 5" H x 15.25" D x 15" W
Weight	<ul style="list-style-type: none"> • 20 lb.
Operating System	<ul style="list-style-type: none"> • AmigaDOS 3.0, a powerful, eighth-generation, preemptively multitasking operating system that is 100% compatible with all Amiga systems

A4000T BLOCK DIAGRAM



AMIGA 4000T SPECIFICATIONS

Microprocessor	<ul style="list-style-type: none">• Motorola® 32-bit 68040 @ 25 MHz
Memory	<ul style="list-style-type: none">• 2 MB of 32-bit Chip RAM• Up to 16 MB of 32-bit Fast RAM on motherboard, expandable via four standard 72-pin SIMM sockets• 512 KB ROM containing AmigaDOS 3.1
Disk Drives	<ul style="list-style-type: none">• Built-in 3.5-inch high density (880 KB/1.76 KB) floppy drive• Hard drive models pre-formatted and pre-loaded with system software• Internal cabling and interfaces directly support SCSI-2 and IDE devices• Three front 5.25/3.5-inch drive bays, horizontal mount• Two front 5.25/3.5-inch drive bays, vertical mount• One internal 5.25/3.5-inch full-height drive bay, vertical mount
Ports	<ul style="list-style-type: none">• Two mouse/joystick ports (support Amiga mouse, game joysticks, light pens, track balls, other controllers)• Keyboard (94 key)• Serial port (RS-232)• Parallel port (supports standard Centronics® printers)• SCSI-2 (50-pin)• External floppy disk drive port
Video Ports	<ul style="list-style-type: none">• RGB video (RGB analog and RGBI digital)• 23-pin to 15-pin adapter for connection to VGA/SVGA monitors included
Audio	<ul style="list-style-type: none">• Stereo line out (right and left)• Amiga audio: stereo 8-bit PCM 4-voice audio• Internal speaker
Amiga Custom Chipset Video Capabilities	<ul style="list-style-type: none">• Programmable screen resolutions and raster timing<ul style="list-style-type: none">- Maximum of 1448 pixels/line × 482 lines in NTSC 15 KHz modes- VGA and SVGA to 800 × 600 resolutions (with optional RGB adapter)- NTSC/PAL compatible- CCIR 601 studio-quality video- 35 ns pixels (Super High Resolution mode)- Programmable overscan• Hardware de-interlacing and scan line doubling• Hardware vertical and horizontal scrolling on two independent playfield screens• Hardware panning on 16,384 × 16,384 pixel images• Eight sprites (16, 32, or 64 pixels wide × n pixels high)• Attachable sprites• Sprite collision detection in hardware• 24-bit color palette (16.8 million colors)• Dynamically updatable palette (on a scan line basis)• 8 bitplanes supporting 256 colors from a palette of 16.8 million colors

**Amiga Custom
Chipset Video
Capabilities
(cont'd)**

- Hold and Modify mode supporting screens of over 256,000 colors from a palette of 16.8 million colors
- Two video accelerator coprocessors
 - High performance BLITTER
 - Block moves
 - Line drawing
 - Area fills
 - 256 operations from three sources to one destination
 - Video coprocessor
 - Independent coprocessor for control of video and audio systems
 - Allows video control synchronous with beam position
 - Genlock input support for video overlays

Bus Expansion

- Supports advanced processors and high-speed memory
- Five 100-pin Zorro III Amiga slots with AUTOCONFIG™ (two in line with video slots)
- Four PC-AT slots (three in line with Zorro III slots)
- Two extended 24-bit video slots
- 200-pin local bus connector

Power

- Internal (either 110V or 220/240V), with fan
- 150 watts

Size

- 21" H x 20" D x 7" W

Weight

- 35 lb.

**Operating
System**

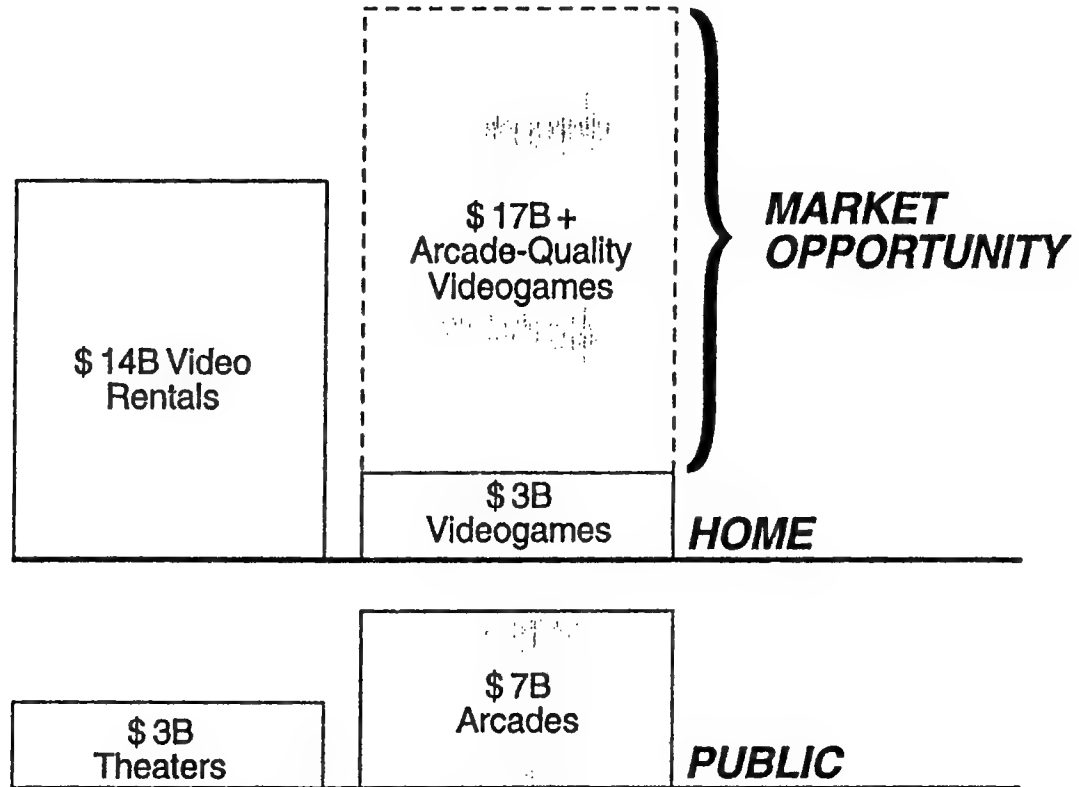
- AmigaDOS 3.1, a powerful, eighth-generation, preemptively multitasking operating system that is 100% compatible with all Amiga systems

Commodore Amiga CD³²

- **32bit Game Console with integrated CD-ROM**
- **Powerful 68020 32bit CPU**
- **3rd Generation Amiga Chipset**
- **Realtime Multitasking AmigaOS**
- **2x Speed CD-ROM**
- **Optional Computer Module**
- **Optional Full Motion Video Module**

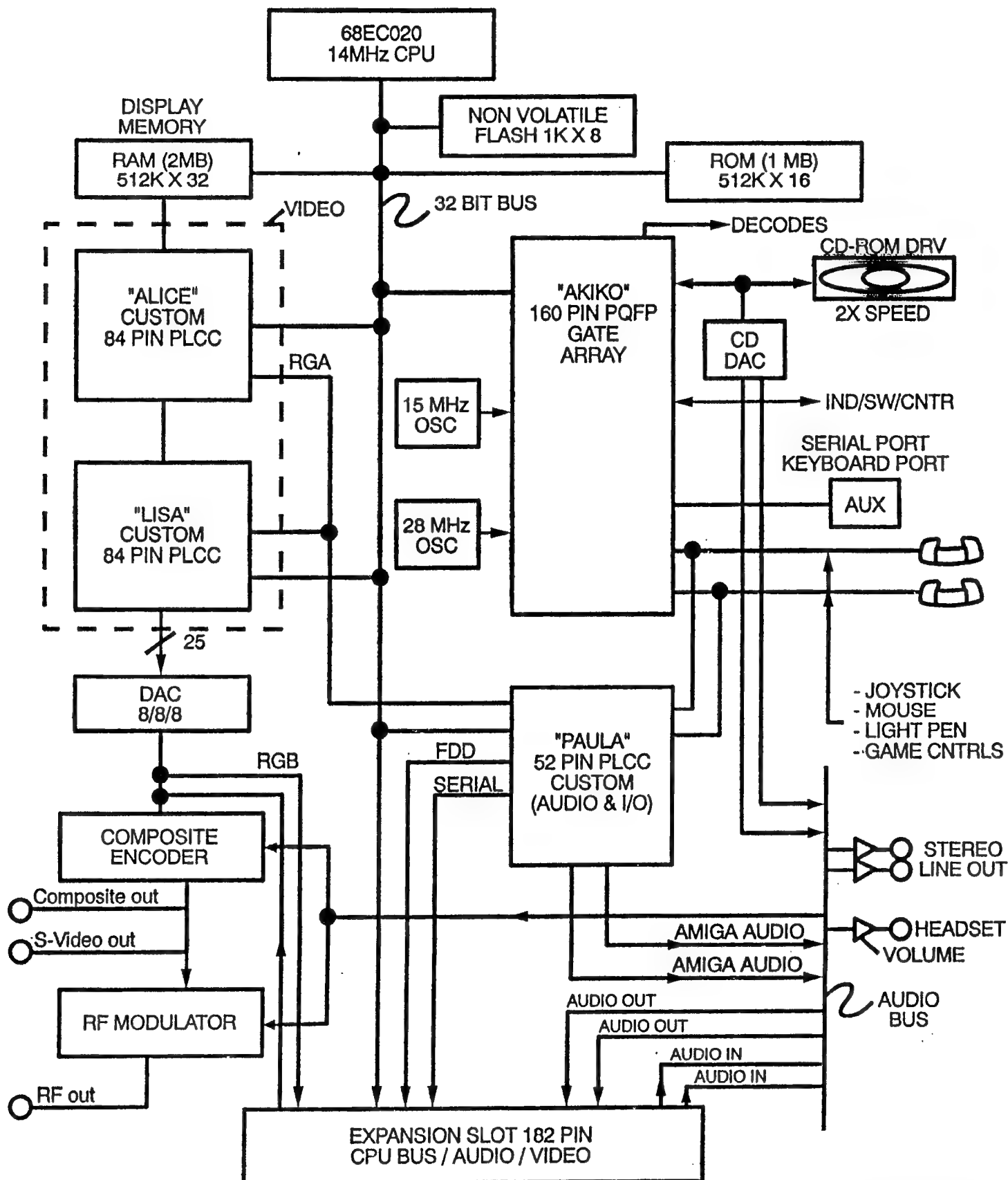
□ **GAME MACHINE OPPORTUNITY**

- **Home Video Market Is 3x Movie Theater Market**
 - Convenience of Home Usage
 - Similar Quality/Excitement
- **Home Video Games Should Be 3x Arcade (\$17B)**
 - Market Growth Awaits Arcade-Quality Home Video Games



With FMV option, AMIGA CD can also address this market opportunity

AMIGA CD³² BLOCK DIAGRAM



Amiga CD³² Comparison with SegaCD & NintendoCD

	<u>AmigaCD³²</u>	<u>SegaCD</u>	<u>NintendoCD</u>
CPU/Speed:	68EC020/14MHz	2x68000/12MHz	65816/3.58MHz
Bits:	32 bit	16 bit	8/16
MIPS:	3.5 MIPS	0.3 MIPS	0.1 MIPS
Chip RAM:	2M DRAM	64KB VRAM	Custom RAM??
Fast RAM:	None	64KB SRAM	64KB SRAM
Non Volatile RAM:	1KB	8KB	Yes, ?KB
Custom Chips:	I/O ports, audio and interrupt controller DMA controller Video data controller CD-ROM controller	2 custom chips in base 3 custom chips in CD	5 custom chips in base 32-bit CD co-processor
Animation CELS:	8 Sprites (64 bit) & Bobs	80 Sprites (32 bit)	128 Sprites (64 bit)
Video Modes:	640x400, 15KHz	320x200, 15KHz	512x448, 15KHz
Colors:	256,000/16 Million	64/512 colors	256/32768
Speed:	7M Pixels/sec	??	??
Sound:	Stereo 8 bit Stereo CD-DA DSP planned	Mono 8 bit FM Stereo CD-DA No DSP	Stereo 16 bit Stereo CD-DA DSP
CD-ROM:	Double Speed Top Loading Chinon/Sony	Single Speed Drawer Load Sony	Double Speed ?? Mitsumi

Amiga CD³² Comparison with SegaCD & NintendoCD

	<u>AmigaCD32</u>	<u>SegaCD</u>	<u>NintendoCD</u>
Software License:	\$3/disc	≈ \$10/disc	≈ \$10/disc
S/W Video Player:	Partial screen 4096 colors	Partial screen 16 colors	Full Screen 256 colors
MPEG:	Planned	No	No
PhotoCD:	Planned	No	No
Video Frame Grabber:	Not Planned	No	No
H/W Warping:	No	No	Yes
H/W Transparency:	No	No	No
H/W Lighting Effects:	No	No	No
H/W Anti-Aliasing:	No	No	No
H/W Texture Mapping:	No	No	Yes
Game Controller:	11 buttons	8 buttons	12 buttons
Parallel/Serial:	Planned	No	No
Floppy/Hard Drive:	Planned	No	No
Keyboard/Mouse:	Planned	No	Planned Mouse
Computer Expansion:	Yes	No	No
Development System Cost:	\$3,000	?	?
Partners:	None	JVC [WonderMega] Pioneer	None
Suggested Retail Price:	\$399	\$299+\$99	\$??+\$99
Availability:	June 1993	Now	1994

Amiga CD³² Comparison with 3DO

	<u>Amiga CD³²</u>	<u>3DO</u>
CPU/Speed:	68EC020/14MHz	ARM60/12MHz
Bits:	32 bit	32 bit
MIPS:	3.5 MIPS	6 MIPS
Chip RAM:	2M DRAM	1M VRAM
Fast RAM:	None	1M DRAM
Non Volatile RAM:	1KB	Memory Card
Custom Chips:	I/O ports, audio and interrupt controller DMA controller Video data controller CD-ROM controller	Two animation Processors Video Processor DSP, DMA Engine Exp. Controller
Animation CELS:	8 Sprites (64 bit) & Bobs	Yes (100s)
Video Modes:	640x400, 15KHz	640x400, 15KHz
Colors:	256,000/16 Million	256/32768
Speed:	7M Pixels/sec	64M Pixels/sec
Sound:	Stereo 8 bit Stereo CD-DA DSP planned	Stereo 16 bit Stereo CD-DA DSP
CD-ROM:	Double Speed Top Loading Chinon/Sony	Double Speed Drawer Load MKE

Amiga CD³² Comparison with 3DO

	<u>Amiga CD³²</u>	<u>3DO</u>
Software License:	\$3/disc	\$3/disc
S/W Video Player:	Partial screen 256,000 colors	Full screen 256 colors
MPEG:	Planned	Planned
PhotoCD:	Planned	In ROM
Video Frame Grabber:	Not Planned	Planned
H/W Warping:	No	Yes
H/W Transparency:	No	Yes
H/W Lighting Effects:	No	Yes
H/W Anti-Aliasing:	No	Yes
H/W Texture Mapping:	No	Yes
Game Controller:	11 buttons	8 buttons
Parallel/Serial:	Planned	Planned
Copy/Hard Drive:	Planned	Not Planned
Keyboard/Mouse:	Planned	Planned
Computer Expansion:	Yes	Not Planned
Development System Cost:	\$3,000	\$10,000+
Partners:	None	Matsushita Time Warner AT&T Electronic Arts
Suggested Retail Price:	\$399	\$699
Availability:	June 1993	Christmas goal

Amiga CD32 Title Availability

Publisher	Title	NTSC	PAL
21st Century	Pinball Fantasies	YES	YES
Acid Software	Skidmarks	?	YES
Adventuresoft	Simon the Sorcerer	YES	YES
Almathera	Prey	No	YES
Almathera	Video Creator	YES	YES
Alternative S/ware	Dennis & Gnasher	YES	YES
Alternative S/ware	Tracksuit Manager '94	YES	YES
Apache	Super Methane Brothers	YES	YES
Audiogenic	Bubble & Squeek	YES	YES
Audiogenic	World Class Cricket	YES	YES
CBM / New Media	Guiness II	YES	YES
CBM / Optonica	Insight: Technologies	YES	YES
CBM / Plattsoft	Amiga American Football	YES	YES
CBM / Sachs	Defender of The Crown II	YES	YES
CBM / Xiphias	Groliers Encyclopeadia	YES	YES
CBM / Xiphias	Timetable: Science & Inovation	YES	YES
CBM / Xiphias	Timetable:Business,Politics and Media	YES	YES
Codemasters	Captain Dynamo	YES	YES
Codemasters	CJ's Elephant Antics	YES	YES
Codemasters	Dizzy Prince of Yolkfolk	YES	YES
Codemasters	Magicland Dizzy	YES	YES
Core Design	Buba`nStix	?	YES
Core Design	Chuck Rock I	YES	YES
Core Design	Chuck Rock II	?	YES
Core Design	Premier	?	YES
Creative Edge	Baldy	?	YES
Cyber Dreams	Dark Seed	YES	YES
Digital Integration	Tornado	?	YES

Amiga CD32 Title Availability

Publisher	Title	NTSC	PAL
Discus	Cinderella	YES	YES
Discus	Heather Hits a Home Run	YES	YES
Discus	Long Hard Day at the Ranch	YES	YES
Discus	Moving Gives Me a Stomach Ache	YES	YES
Discus	Mud Puddle	YES	YES
Discus	Paper Bag Princess	YES	YES
Discus	Scary Poems for Rotten Kids	YES	YES
Discus	Tale of Benjamin Bunny	YES	YES
Discus	Tale of Peter Rabbit	YES	YES
Discus	Thomas's Snowsuit	YES	YES
Domark	Heimdall 2	YES	YES
Domark	Herewith the Clues	YES	YES
Domark	Trivial Pursuit	No	YES
Electronic Arts	Labyrinth of Time	YES	YES
Extender	Lionheart	YES	YES
Gametek	Elite II	YES	YES
Grandslam	Beavers	YES	YES
Grandslam	Chambers of Shaolin	YES	YES
Grandslam	Liverpool Football	YES	YES
Grandslam	Nick Faldo's Golf Deluxe	YES	YES
Grandslam	Seven Gates of Jambala	YES	YES
Gremlin	Disposable Hero	YES	YES
Gremlin	Legend of Sorasil	YES	YES
Gremlin	Lotus Turbo Trilogy	YES	YES
Gremlin	Nigel Mansell	YES	YES
Gremlin	Zool	YES	YES
Gremlin	Zool 2	YES	YES
Hex	Global Chaos	YES	YES

Amiga CD32 Title Availability

Publisher	Title	NTSC	PAL
I.C.E.	Deep Core	YES	YES
I.C.E.	Fire Force	YES	YES
I.C.E.	Gulp	YES	YES
I.C.E.	Mean Arenas	YES	YES
I.C.E.	Total Carnage	YES	YES
Interplay	Battle Chess	YES	YES
Interplay	Castles II	YES	YES
Interplay	Lost Vikings	YES	YES
Krysalis	Arabian Knights	YES	YES
Krysalis	Fly Harder	YES	YES
Krysalis	John Barnes Football	YES	YES
Krysalis	Manchester United Premier League Champions	YES	YES
Krysalis	Sabre Team	YES	YES
Krysalis	Soccer Kid	YES	YES
Krysalis	Traps & Treasure	YES	YES
Lascelles	The Connoisseur Fine Art Collection	YES	YES
Maxis	SimCity	YES	YES
Microprose	Gunship 2000	NO	YES
Microprose	Pirate's Gold	YES	YES
Microvalue Flair	Dangerous Streets	YES	YES
Microvalue Flair	Golden Collection	YES	YES
Microvalue Flair	Oscar	YES	YES
Microvalue Flair	Summer Olympix	YES	YES
Microvalue Flair	Surf Ninjas	YES	YES
Microvalue Flair	Trolls	YES	YES
Microvalue Flair	Whales Voyage	YES	YES

Amiga CD32 Title Availability

Publisher	Title	NTSC	PAL
Millenium	Brutal Football	YES	YES
Millenium	Diggers	YES	YES
Millenium	Global Effect	YES	YES
Millenium	James Pond 2	YES	YES
Millenium	James Pond III	YES	YES
Millenium	Morph	No	YES
Millenium	Pinkie	YES	YES
Mindscape	Alfred Chicken	YES	YES
Mindscape	Battle Toads	No	YES
Mindscape	D/Generation	YES	YES
Mindscape	Fury of the Furries	YES	YES
Mindscape	Liberation - Captive 2	YES	YES
Mindscape	Overkill/Lunar`c	No	YES
Mindscape	Seek & Destroy	No	YES
Mirage	Rise of the Robots	YES	YES
Multimedia Machine	Games & Goodies	No	YES
MultiMedia Machine	Games-1	No	YES
MultiMedia Machine	Games-2	No	YES
Multimedia Machine	Ultimate Pinball Quest	?	YES
Ocean	Dennis	YES	YES
Ocean	Inferno	YES	YES
Ocean	Rainbow Collection	YES	YES
Ocean	Ryder Cup Golf	YES	YES
Ocean	Sleepwalker	YES	YES
Ocean	T.F.X.	YES	YES
Optonica	Insight: Dinosaurs	YES	YES
Oxford Softworks	Chess `94	No	YES
Psygnosis	Hired Guns	YES	YES
Psygnosis	Lemmings	YES	YES
Psygnosis	Microcosm	YES	YES
Psygnosis	Second Samurai	YES	YES

Amiga CD32 Title Availability

Publisher	Title	NTSC	PAL
Renegade	Chaos Engine	YES	YES
Renegade	Elf Mania	YES	YES
Renegade	Fire & Ice	No	YES
Renegade	Flight of the Amazon Queen	YES	YES
Renegade	Sensible Soccer	No	YES
Renegade	Turrican III	YES	YES
Seriat	Stamps of France & Monaco	YES	YES
Sierra	Kings Quest 6	?	YES
Software Inspiration	Ceaser Deluxe/Cohort II	No	YES
Supervision	Donk Special Edition	No	YES
System 3	Flimbo`s Quest	No	YES
System 3	Fuzball	YES	YES
System 3	International Karate Plus	YES	YES
System 3	Myth	YES	YES
System 3	Ninja III	YES	YES
System 3	Putty Squad	YES	YES
System 3	Super Putty	YES	YES
Team 17	Alien Breed 2	No	YES
Team 17	Body Blows 2/Body Blows Galactica	No	YES
Team 17	Project X/F17 Challenge	No	YES
Team 17	QWAK/Alien Breed	No	YES
Team 17	Ultimate Body Blows	No	YES
Thallion	No Second Prize	YES	YES
Tiger Media	Case of the Cautious Condor	YES	YES
Titus	Battlestorm	YES	YES
Titus	Prehistoric	YES	YES
Troika	Heroic Age of Spaceflight	YES	YES
Virgin	Cannon Fodder	No	YES
Virgin	Musicolor	YES	YES
Wierd Science	Work Rest & Play	No	YES

Integrated Circuit Vendors

CHIP	System	Vendor
Fat Agnus	ECS, A500, etc.	CSG
Denise	ECS, A500, etc.	CSG
Alice	AA,A1200,A4000,etc.	CSG/(port to UMC)
Lisa	AA,A1200,A4000,etc.	TSMC
Paula	All	CSG/(port to UMC)
CIA(8520)	All except CD32	CSG(as ASIC in Akiko)
Gary	A4000	CSG
Buster	A4000	CSG
Ramsey	A4000	CSG
Gayle	A1200	CSG
Budgie	A1200	VLSI
Bridgette	A4000	NCR
Akiko	CD32	VLSI

PRODUCT COST

	<u>A1200</u>	<u>A4000/040</u>	<u>CD32</u>
SEMICONDUCTOR CHIPS	\$ 11	\$ 20	\$ 6
DRAM	50	186	50
BARE PCB	19	33	12
PROCESSOR	8	170	8
OTHER COMPONENTS	50	207	67
	-----	-----	-----
SUBTOTAL PCB ASSEMBLY	138	616	143
FLOPPY DRIVE	33	47	57
POWER SUPPLY	14	32	10
KEYBOARD	9	23	-
CASEWORK	3	13	2
OTHER FINAL ASSEMBLY COMPONENTS	17	53	12
	-----	-----	-----
TOTAL MATERIAL	214	784	224
MANUFACTURING COSTS	10	29	10
SEA FREIGHT AND DUTY	2	52	1
	-----	-----	-----
TOTAL COST	\$ 226	\$ 865	\$ 235
	=====	=====	=====

6 MB
NO. HDD

PRODUCT MARGIN

	<u>SELLING PRICE</u>	<u>PRODUCT COST</u>	<u>UNIT MARGIN AMOUNT</u>	<u>%</u>
A1200	\$ 292	\$ 226	\$ 66	23
A4000/6MB/NO HDD	1,509	865	644	43
CD32	235	235	-	-
1084 MONITOR	172	125	47	27

A4000 Tower Cost Reduction Path

	Current	Fall	Summer/Fall
MOS Chips	\$20.15	\$20.15	\$25.00
IC LISA	\$7.70	\$7.70	
IC Bridgette	\$5.32	\$4.85	
Bare PCB	\$58.50	\$50.00	\$45.00
SIMMS/DRAM (6MB)	\$150.00	\$145.00	\$140.00
ROMs (2 pcs)	\$5.00	\$4.66	\$4.00
IC Video DAC	\$3.40	\$3.00	\$3.00
PALS	\$14.56	\$12.00	\$5.00
SIMM Sockets	\$9.00	\$7.50	\$7.00
Other PCBA Components	\$62.05	\$60.00	\$55.00
SCSI	\$28.00	\$25.00	\$20.00
Sub Total PCBA	\$363.68	\$339.86	\$304.00
Aud/Vid. Disk. Ports Boards	\$37.00	\$34.00	\$34.00
Bare PCB - CPU Board	\$5.25	\$5.00	\$5.00
'040	\$170.00	\$160.00	\$160.00
PALS	\$41.68	\$40.00	\$15.00
TTL	\$24.00	\$22.00	\$15.00
Other PCBA Components	\$16.00	\$15.00	\$25.00
Sub Total PCBA	\$256.93	\$242.00	\$220.00
HDD	\$290.00	\$290.00	\$290.00
KB	\$23.00	\$23.00	\$23.00
Power Supply	\$28.00	\$28.00	\$28.00
Mouse	\$4.60	\$4.60	\$4.60
FDD	\$49.00	\$45.00	\$45.00
Casework	\$60.00	\$55.00	\$55.00
Manuals	\$8.00	\$6.00	\$6.00
Other FA components	\$16.00	\$15.00	\$15.00
Sub Total Final Asm	\$478.60	\$466.60	\$466.60
Total Materials Cost	\$1,136.21	\$1,048.46	\$990.60
Usage Allowance	\$10.16	\$10.16	\$10.16
Labor/OH --PCBA	\$12.00	\$11.32	\$11.32
-FA	\$11.00	\$11.00	\$11.00
-S/W Dup	\$0.20	\$0.20	\$0.20
Duty to Europe	\$58.48	\$54.06	\$51.16
Royalties	\$1.00	\$1.00	\$1.00
Freight (Sea)	\$7.39	\$7.39	\$7.39
Freight In for Components	\$10.16	\$9.38	\$9.38
Total FG Landed Costs	\$1,246.60	\$1,152.97	\$1,092.21

A1200 Cost Reduction Path

	Current	Fall	Summer/Fall
MOS Chips	\$10.85	\$10.85	\$15.00
IC LISA	\$9.00	\$7.70	\$0.00
68EC020-16	\$7.61	\$6.50	\$0.00
IC Budgie	\$10.00	\$6.50	\$0.00
Bare PCB	\$20.00	\$18.00	\$15.00
DRAM 256K X 16 (4 pcs)	\$50.32	\$49.00	\$48.00
IC 4 MB ROM	\$5.00	\$4.25	\$4.25
IC Video DAC	\$2.37	\$2.90	\$2.90
Modulator	\$2.80	\$2.60	\$2.60
Other PCBA Components	\$23.25	\$20.00	\$19.00
Sub Total PCBA	\$141.20	\$128.30	\$106.75
KB	\$8.20	\$8.45	\$8.45
Power Supply	\$13.79	\$13.00	\$13.00
Mouse	\$4.60	\$4.50	\$4.50
FDD	\$32.28	\$30.00	\$30.00
Casework	\$2.75	\$2.50	\$2.50
Manuals	\$1.83	\$1.83	\$1.83
Other FA components	\$10.65	\$10.00	\$10.00
Sub Total Final Asm	\$74.10	\$70.28	\$70.28
Total Materials Cost	\$215.30	\$198.58	\$177.03
Usage Allowance	\$2.24	\$2.06	\$2.06
Labor/OH -PCBA	\$4.00	\$4.00	\$3.00
-FA	\$4.00	\$4.00	\$3.00
Fee			
Freight (Sea)	\$2.72	\$2.27	\$2.27
Freight In for Components	\$2.24	\$2.06	\$2.06
Total FG Landed Costs	\$230.50	\$212.97	\$189.42

CRITICAL VENDORS
CUSTOM COMPONENTS

<u>Oscillators</u>	<u>Lead Time</u>
Udem	4 weeks
Karin	4 weeks
 PCB	
Gold Circuits	6 weeks
PCB Center	6 weeks
Elec & Eltec	6 weeks
 DelayLine/Band Pass/Modulator	
Mitsumi Electronics	8 weeks
 Battery	
Varta	4 weeks
 Switches	
Janel Hua	
Jin Tay	
 Plastics	
Plastimer	A1200 Tooling
Lian Yuh	
Ambo (CDGS Only)	CD32 Tooling
 Metal	
Heng Meng	A1200/CD32
Cheng Fwa	A4000/CD32 Tooling
Rong Tai Wangtex	A4000 Tooling
Chi Sing	A4000 Tooling
Genral Mechanical (CDGS)	CD32 Tooling
 Screws	
Lahoz	2 weeks
Teo Cheow	2 weeks
 ICs	
VLSI	12-14 weeks
Hewlett Packard	12-14 weeks
NCR	12-14 weeks
In-house (CSG)	-

Amiga Patents Summary

- 1. Basic Amiga** -- Seven US patents and related foreign filings covering the Basic Amiga technology, including the Custom Coprocessor design, Amiga peripheral control, Amiga floppy disk control, Amiga Blitter, the AmigaDOS/Workbench user interface, an Amiga Joystick and bit plane register synchronization used in Amigas.

- 2. Advanced Amiga** -- Two US patents, an application and related foreign filings covering Zorro Bus Controller, elements of the AAA chipset and Audio signal processing

- 3. Amiga Related** -- Four US patents and related foreign filings covering a video demultiplexor (Hedley Hi-Res), Amiga expansion slots, an ALU adder and a cache type execution accelerator circuit.

- 4. Application Software** -- One US patent, two applications and related foreign filings covering the AmigaVision authoring system application software.

- 5. Amiga CD-32** -- A design patent and seven US patent applications covering CD error detection, CD data decoding, video image processing, an input controller, a pointer, the CD 32 interface, and a continuation of one of the basic Amiga patents

Non-Amiga Patents

6. **C64 and Related Products** -- Thirteen US patents and related foreign filings covering several of the I/Cs used in the C64 and related products including sound interface circuitry, cursor information circuitry, and sprite circuitry, as well as filings covering a mouse controller

7. **CDTV** -- One patent application covering CD transfer protocol.

8. **Early I/Cs** -- Four US patents and a related foreign filing covering I/C structure for early MOS devices.

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9. **Non-Computer** -- Ten US patents and related foreign filings covering watches thermostats, an LED, a fluorescent light, and an autoclave door.

TRADEMARKS

Commodore

Amiga

CD32

Bridgecard

Amiga 1000

Amiga 2000

Amiga 2500

Amiga 500

Amiga 3000

Amiga 3000 Tower

Amiga 600

Amiga 1200

Amiga 4000

Amiga 4000T

Pet 2000

Vic 20

Commodore 64

C64

Commodore 128

C128

Monitors: 2002, 1084, 1084S, 1942, 1960, 1080

All other production products marketed and sold by CEL and its subsidiaries or wholly owned companies.

KEY COMMODORE TECHNOLOGIES

☐ ***AMIGA CHIPSETS***

- ECS, AA
- NEXT GENERATIONS: AA+, AAA, RISC/3D

☐ ***AMIGADOS***

- MULTITASKING, REALTIME OS
- GRAPHICAL USER INTERFACE
- STABLE 5th GENERATION
- SMALL MEMORY REQUIREMENTS

☐ ***MULTIMEDIA AUTHORIZING TOOLS***

- AMIGAVISION
- CD-ROM SUPPORT TOOLS
- FMV ENCODING TOOLS
- LARGE FAMILY OF 3rd PARTY TOOLS

☐ ***CD-ROM TECHNOLOGY***

- LOW COST DRIVE MECHANISM
- PROPRIETARY MICRO CODE

☐ ***DSP TECHNOLOGY***

- DSP HARDWARE ADAPTER
- AMIGA-BASED DSP DEVELOPMENT TOOLS

☐ ***FULL MOTION VIDEO TECHNOLOGY***

- HARDWARE & SOFTWARE ENCODERS & DECODERS

AMIGADOS

- ☐ **5th GENERATION OS, VERY STABLE**
- ☐ **ROMABLE**
- ☐ **TAKES LESS THAN 1/2 MB ROM**
- ☐ **TRUE MULTITASKING, REALTIME OS**
- ☐ **FULL GRAPHICAL USER INTERFACE**
- ☐ **SUPPORTS TV TO SVGA SCREEN RESOLUTIONS**
- ☐ **WORKS ON ALL PROCESSORS (68000 TO 68060)**
- ☐ **FDD & CD-ROM VERSIONS SUPPORTED**
- ☐ **RUNTIME SUPPORT FOR ~ 17 LANGUAGES**
- ☐ **SUPPORTS BOTH SCSI & IDE DEVICES**
- ☐ **SUPPORTS CD-ROM ISO 9660 FILE SYSTEMS
(WITH MULTISESSION)**
- ☐ **SUPPORTS PCMCIA V.2 CARDS**
- ☐ **SPECIAL EXTENSION SUPPORTED FOR GAMES**
- ☐ **1/2 SIZE & 5X PERFORMANCE OF MODULAR[†]
WINDOWS**
- ☐ **EXTENSIVE DEVELOPMENT TOOLS**
- ☐ **MULTIMEDIA AUTHORIZING TOOLS**

AA CHIPSET (Introduced 1992)

❑ ***FULL 32 BIT SYSTEM DESIGN***

❑ ***≈ 450 K TRANSISTOR***

❑ ***ONE OSC SYNCHRONOUS DESIGN***

❑ ***FOUR LOW-COST CUSTOM DEVICES
(AA CHIPSET)***

- "ALICE" 84 PIN PLCC (VIDEO)
- "LISA" 84 PIN PLCC (VIDEO)
- "PAULA" 52 PIN PLCC (SOUND & I/O)
- "CIA" 44 PIN PLCC (I/O & T/C & IRQ)

❑ ***SYSTEM SPECIFIC GATE ARRAYS***

- "GAYLE" 84 PIN PLCC (MPU BUS I/F)
- "BUDGIE" 128 PIN PLCC (IDE & PCMCIA V.2)
- "AKIKO" 160 PIN PQFP (CD-ROM & I/O)
- "KBD" 44 PIN PLCC (KEYBOARD SCANNER)
- "BUSTER" 84 PIN PLCC (ZORRO EXP BUS CONTROL)
- "RAMSEY" 84 PIN PLCC (DRAM CONTROLLER)

AA CHIPSET I/O "PAULA"

- ☐ ***"PAULA" CUSTOM CHIP***
- ☐ ***FOUR VOICE STEREO OUTPUT***
- ☐ ***DMA-DRIVEN AUDIO DATA XFER***
- ☐ ***8 BIT PCM DATA UP TO 27 KHz SAMPLE RATE***
- ☐ ***INTEGRATED DACs***
- ☐ ***ASYNC SERIAL PORT***
- ☐ ***FDD PORT***
- ☐ ***TWO PORT "AUX" INPUTS***
 - **MOUSE**
 - **JOYSTICKS**
 - **LIGHT PEN**
 - **GAME CONTROLLERS**

AA CHIPSET I/O "CIA"

- ☐ ***COMPLEX INTERFACE ADAPTERS (CIA)***
- ☐ ***TIMERS***
- ☐ ***COUNTERS***
- ☐ ***IRQ CONTROLLER***
- ☐ ***SERIAL PORT (KEYBOARD)***
- ☐ ***PRINTER PORT***
- ☐ ***FDD CONTROLS***
- ☐ ***MODEM CONTROLS***
- ☐ ***AUX PORT CONTROLS***

VIDEO SUB-SYSTEM

- ☐ ***TWO CUSTOM CHIPS***
- ☐ ***"ALICE" & "LISA"***
- ☐ ***3rd GENERATION AMIGA DESIGN***
- ☐ ***≈ 300 K TRANSISTOR***
- ☐ ***≈ 23 DMA CHANNELS***
- ☐ ***VIDEO PIXEL RATES PROGAMMABLE TO 28 MHz***
- ☐ ***SCAN RATES TO 31.5 KHz***
- ☐ ***REFRESH RATE TO 72 Hz***
- ☐ ***PROGRAMMABLE RASTER TIMING & RESOLUTIONS***
 - ***NTSC I & NI TO 724 x 480***
 - ***PAL, SECAM***
 - ***VGA & SVGA 640 x 480 NI, 800 x 600 I***

VIDEO SUB-SYSTEM (Continued)

- ☐ **8 BITPLANES IN ALL MODES**
- ☐ **256 COLORS FROM PALETTE OF 16.8 M ON SCREEN**
- ☐ **"HAM" MODE SUPPORTS 256 K OF 16.8 M ON SCREEN**
- ☐ **2 MB VIDEO AND SYSTEM RAM SPACE**
- ☐ **HARDWARE HORIZONTAL & VERTICAL SCROLLING**
- ☐ **TWO INDEPENDENT PLAYFIELD SCREENS**
- ☐ **EIGHT HARDWARE SPRITES 16, 32 OR 64 x n SIZE**
- ☐ **HARDWARE COLLISION DETECT**
- ☐ **SPRITES ATTACHABLE TO FORM LARGER SPRITES**
- ☐ **HARDWARE "BLITTER" FOR GRAPHIC ACCELERATION**
 - 256 RASTER OPS
 - ON THREE SOURCES
 - LINE DRAW
 - AREA PATTERN FILL
- ☐ **VIDEO SUB-SYSTEM CO-PROCESSOR**
 - INDEPENDENT VIDEO SUB-SYSTEM CONTROLLER
 - BEAM SYNCHRONIZATION
 - PALETTE CHANGES ON THE FLY
- ☐ **HARDWARE DEINTERLACING & SCREEN PROMOTION**
- ☐ **GENLOCK INPUT SUPPORTED**

AAA CHIPSET (Mid-1994 Introduction)

- ☐ **TARGETED AT MID-RANGE TO HIGH END "PC" PRODUCTS**
- ☐ **INITIAL IMPLEMENTATION IS FOUR CUSTOM CHIPS**
- ☐ **SCALABLE TO TWO CHIPS IN 1996 (AAA-CR)**
- ☐ **NEW "AMIGA" ARCHITECTURE**
- ☐ **BACKWARD COMPATIBLE WITH AA & AA+ CHIPSETS**
- ☐ **VRAM OR DRAM IMPLEMENTATION**
- ☐ **4 TO 8X PERFORMANCE OF AA+**
- ☐ **114 MHz VIDEO**
- ☐ **1 K x 1 K SCREENS**
- ☐ **72 Hz REFRESH RATES**
- ☐ **COMPRESSED VIDEO DATA FORMATS**
- ☐ **16 & 24 BIT TRUE COLOR MODES**
- ☐ **32 BIT "BIT" BLITTER (10 TO 20X) AA+**
- ☐ **CD-ROM SERIAL I/F**
- ☐ **ARCHITECTED FOR MULTIPLE "BLITTERS" & LINE BUFFERS**
- ☐ **FRAME GRABBER SUPPORT**
- ☐ **EIGHT VOICE STEREO SOUND**
- ☐ **16 BIT PCM @ > 100 KHz SAMPLE RATE**

COMMODORE FULL MOTION VIDEO (FMV)

- ☐ ***MPEG-1 (FULL VIDEO & AUDIO) PROTOTYPE ADAPTER FOR A4000, A3000, A2000***
- ☐ ***MPEG-1 (FULL VIDEO & AUDIO) PROTOTYPE ADAPTER MODULE FOR AMIGA CD³²***
- ☐ ***ALL DESIGNS UTILIZE C-CUBED VIDEO TECHNOLOGY AND LSI AUDIO TECHNOLOGY (CL450)***
- ☐ ***MPEG-1 & -2 VIDEO & AUDIO ENCODER ADAPTER FOR A4000 NOW UNDER DEVELOPMENT (CL4000)***
- ☐ ***SOFTWARE "DECODERS" BEING PORTED***
 - ***SUPER MAC (FULL SCREEN 24 FPS)***
 - ***XING TECH (1/4 SCREEN 24 FPS)***
- ☐ ***A4000 AT&T DSP ADAPTER SUPPORTS***
 - ***MPEG-1 AUDIO DECODE & ENCODE***
 - ***JPEG STILL VIDEO ENCODE & DECODE***

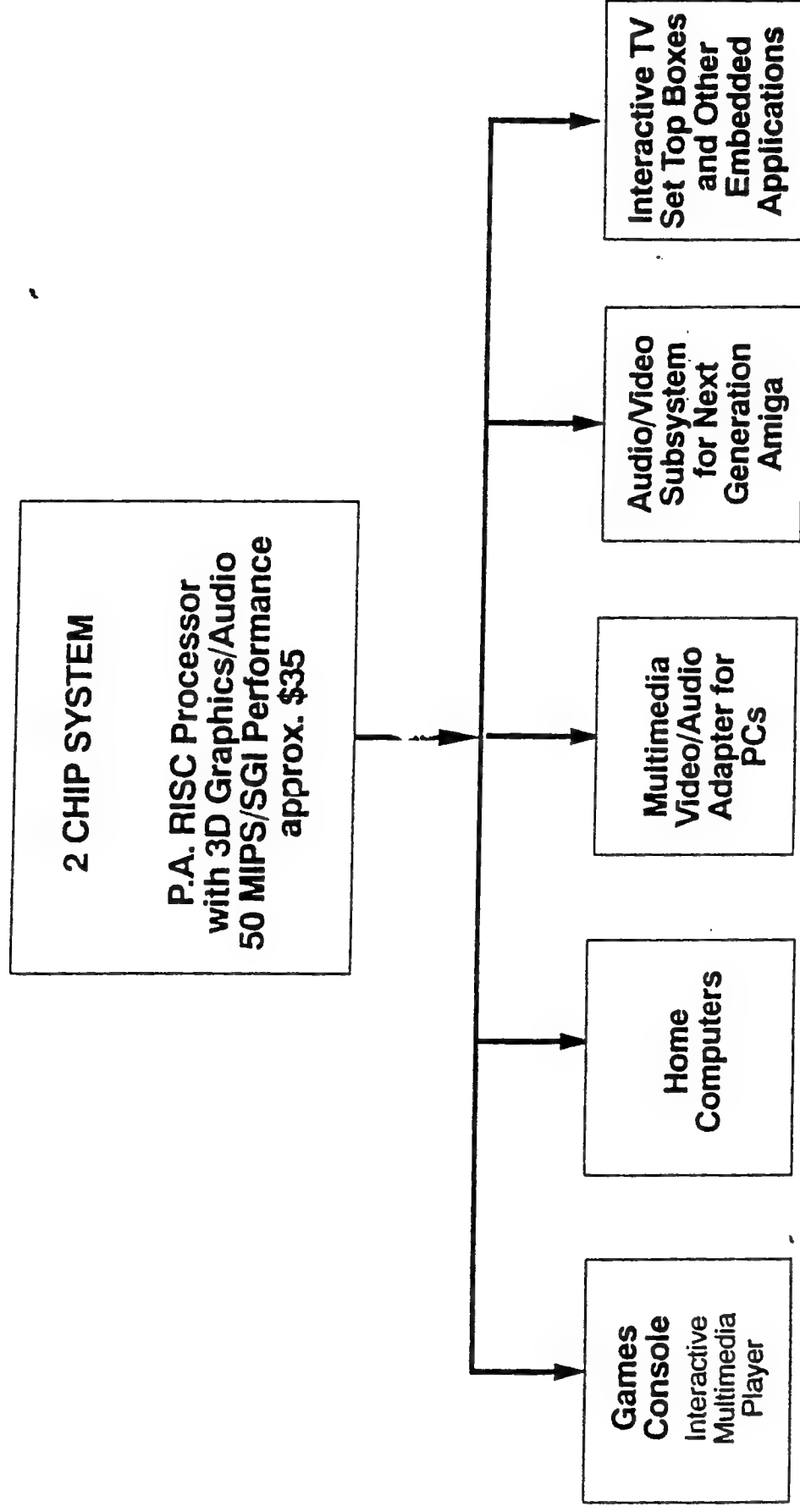
COMMODORE DSP TECHNOLOGY

- ☐ ***DSP CO-PROCESSOR BOARD FOR A4000 UNDER DEVELOPMENT***
- ☐ ***AT&T 3207 (3210 FOLLOW ON) DSP***
- ☐ ***66 MHz***
- ☐ ***1 TO 16 MB DRAM LOCAL MEMORY***
- ☐ ***BUILT-IN 16 BIT STEREO CODEC (44 KHz)***
- ☐ ***MIC IN***
- ☐ ***STEREO LINE OUT***
- ☐ ***MIXED AMIGA AUDIO***
- ☐ ***MODEM DAUGHTERBOARD***
- ☐ ***TWO SERIAL EXPANSION PORTS***
- ☐ ***ZORRO III BUS MASTER SUPPORT***
- ☐ ***FULL DEVELOPMENT ENVIRONMENT PORTED TO AMIGA***
- ☐ ***AT&T APPLICATION LIBRARIES***
 - ***PCM IN/OUT AUDIO 8, 16 BIT***
 - ***ADCDM IN/OUT AUDIO 8, 16 BIT***
 - ***V.32 MODEM***
 - ***AT COMMAND SET***
 - ***V.42 BIS***
 - ***MMP.X***
 - ***2D & 3D GRAPHICS***
 - ***MPEG-1 AUDIO ENCODE/DECODE***
 - ***JPEG ENCODE/DECODE***
 - ***SPEECH SYNTHESIS***
 - ***SPEECH RECOGNITION***

HOMBRE (aka RISC Amiga (RA))

- Next Generation Audio/Video Chipset
- Embedded RISC Processor
- Not Compatible with "Amiga" Chipset
- Designed for Multiple Applications
- Complete Games Console in Two Chips
- Real-Time 3D Rendering and Texture Mapping
- More Than Performance & Cost Competitive with:
 - 3DO
 - Sega Saturn
 - Nintendo SGI
 - Sony/Hitachi

RISC-BASED 3D VIDEO CHIPSET APPLICATIONS



C= Commodore

Manufacturing Restart

- Tooling
- Critical Vendors
- Manufacturing Process
- Philippine Status
- Finished Goods Inventory

TOOLING

- A1200

Top Case:	P/N 364914
Bottom Case:	P/N 364913
Expansion Port:	P/N 364084/5
RAM Expansion:	P/N 365015
Top Shield:	P/N 364911
Bottom Shield:	P/N 364910
FDD Support:	P/N 364982
HDD Support:	P/N 364983

- CD32

Top Case (C):	P/N 365196
Top Case (P):	P/N 365420
Bottom Case:	P/N 365195
Expansion Cover:	P/N 365193
Volume Button:	P/N 365218
Lid:	P/N 365170
Retain Ring (C):	P/N 365234
Retain Ring (P):	P/N 365419
View Window:	P/N 365215
Top Shield:	P/N 365167
Bottom Shield:	P/N 365166
Lid Spring:	P/N 365200
Pivot Arm:	P/N 365201
Pivot Base:	P/N 365203

- A4000 and A4000CR

Chassis:	P/N 363851
Front Bezel:	P/N 364073
Cover:	P/N 363850
Option Bracket:	P/N 364859
Chassis Brace:	P/N 363818
Port Bracket:	P/N 364454
FDD Bracket:	P/N 364206
Cover Plate:	P/N 364465
HDD R/L:	P/N 363819 /01/02
Power Button:	P/N 363830
5.25 Cover:	P/N 364904
3.5 Cover:	P/N 364239

- A4000T

Front Bezel:	P/N 365312
Bezel Door:	P/N 365310
Door Window:	P/N 365309
Disk Bracket:	P/N 365347
Video Bracket:	P/N 365348

- **A500**

Top Case:	P/N 312505
Bottom Case:	P/N 312506
Top Shield:	P/N 312504/358
Bottom Shield:	P/N 312590
RAM Door:	P/N 312591
EXP Cover:	P/N 312595

- A600

Top Case:	P/N 363786
Bottom Case:	P/N 363787
Top Shield:	P/N 363788
Bottom Shield:	P/N 363789
RAM Door:	P/N 363899

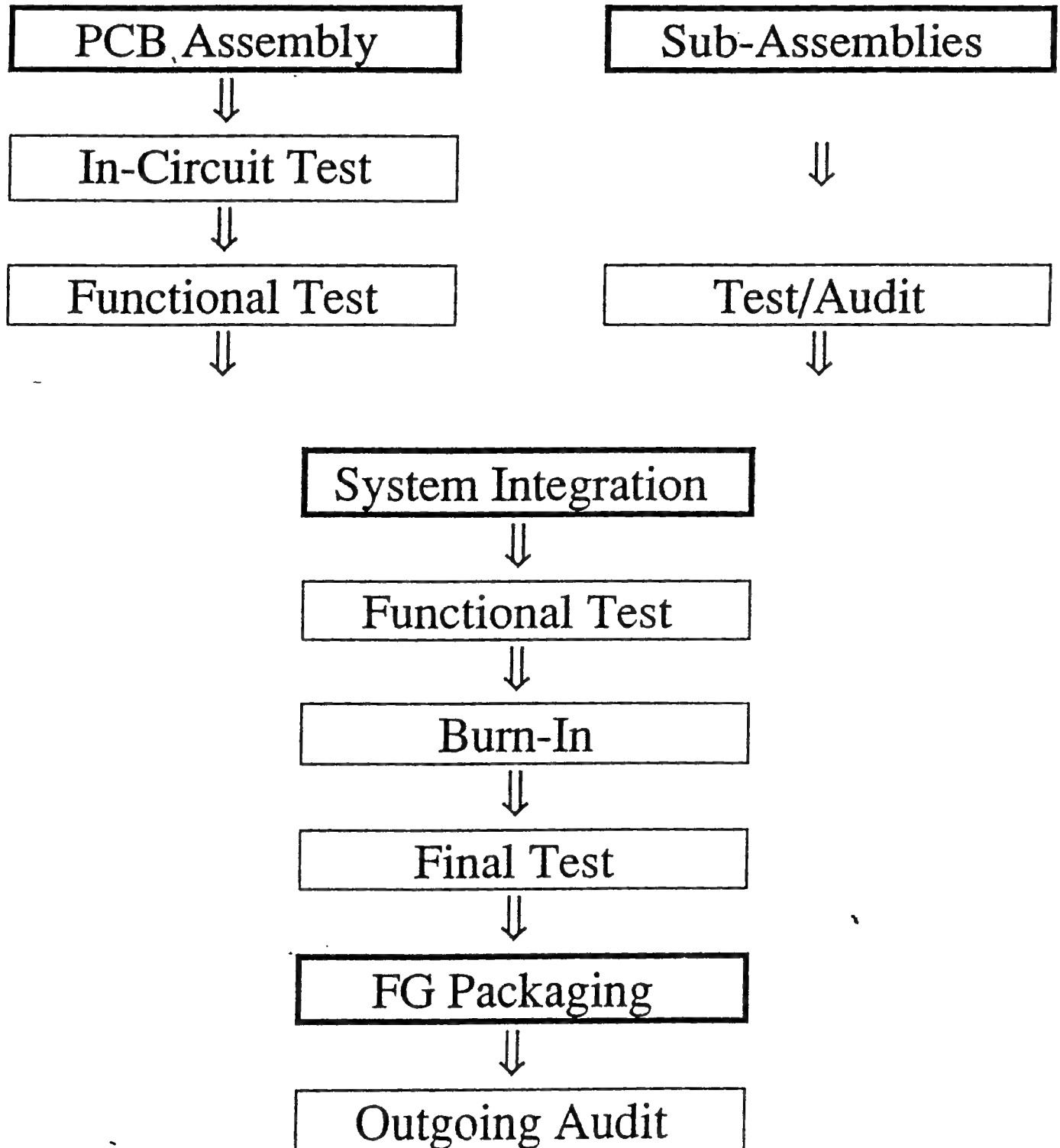
- C-64C and Original 64

Top Case:	P/N 252110
Bottom Case:	P/N 252111
Top Shield:	P/N 252114
Bottom Shield:	P/N 251976
Metal Angle RT:	P/N 252113
Metal Angle LT:	P/N 252450
Top Cover:	P/N 326113 (OLD)
64 Base:	P/N 326114 (OLD)
Top Shield	P/N 332360 (OLD)

- C-65

Top Case:	P/N 313353
Bottom Case:	P/N 313354
Top Shield:	P/N 313355
Bottom Shield:	P/N 313335
RAM Door:	P/N 313361

General Manufacturing & Test Process



Existing Test Equipment & Capacity

<u>Product</u>	<u>Test Station</u>	<u>PHL</u>	<u>SCI</u>	<u>Replacement Cost</u>
A1200	(1 shift capacity)	4K/wk	4K/wk	
	ICT	2	2	\$ 12,000
	PCBA Fxn	6	5	\$ 55,000
	System	6	5	\$ 3,000
	Final	6	5	<u>\$ 6,000</u>
				\$ 76,000
CD32	(1 shift capacity)	5K/wk		
	ICT	3		\$ 9,000
	PCBA Fxn	13		\$ 65,000
	Burn-In	1300		\$ 7,000
	Audio	7		\$ 70,000
	Final	14		<u>\$ 14,000</u>
				\$165,000
CD32 Philips CD Controller		1K/wk		
	ICT	1		\$ 2,000
	PCBA Fxn	1		\$ 5,000
	Final Assy	1		\$ 3,000
	Audit	1		<u>\$ 5,000</u>
				\$ 15,000
A4000	(1 shift capacity)	1K/wk		
	ICT - Main PCB	1		\$ 4,000
	ICT - CPU PCB	1		\$ 4,000
	ICT - Riser PCB	1		\$ 2,000
	PCBA Fxn	2		\$ 15,000
	Audit	1		<u>\$ 5,000</u>
				\$ 30,000

Example Test Equipment List:

1) In-Circuit PCBA Test:

"Bed-of-nails", vacuum activated fixtures designed for Teradyne 1860 MDA Tester.

2) Functional PCBA Test:

Custom "Bed-of-nails" fixtures, activated by either vacuum or physical clamping mechanism. Some products require use of external analyzers such as vectorscopes, GPIB controlled distortion analyzers, etc.

Contains custom test hardware and std subassemblies.

3) Functional System Test:

No specialized fixtures, test performed in actual case. Some hand-connected peripherals.

4) System Burn-in:

No fixtures, some specialized test plugs,

5) Final System Test:

No specialized fixtures, test performed in actual case. Some hand-connected peripherals.

6) Outgoing Audit:

No specialized fixtures, test performed in actual case. Some hand-connected peripherals.

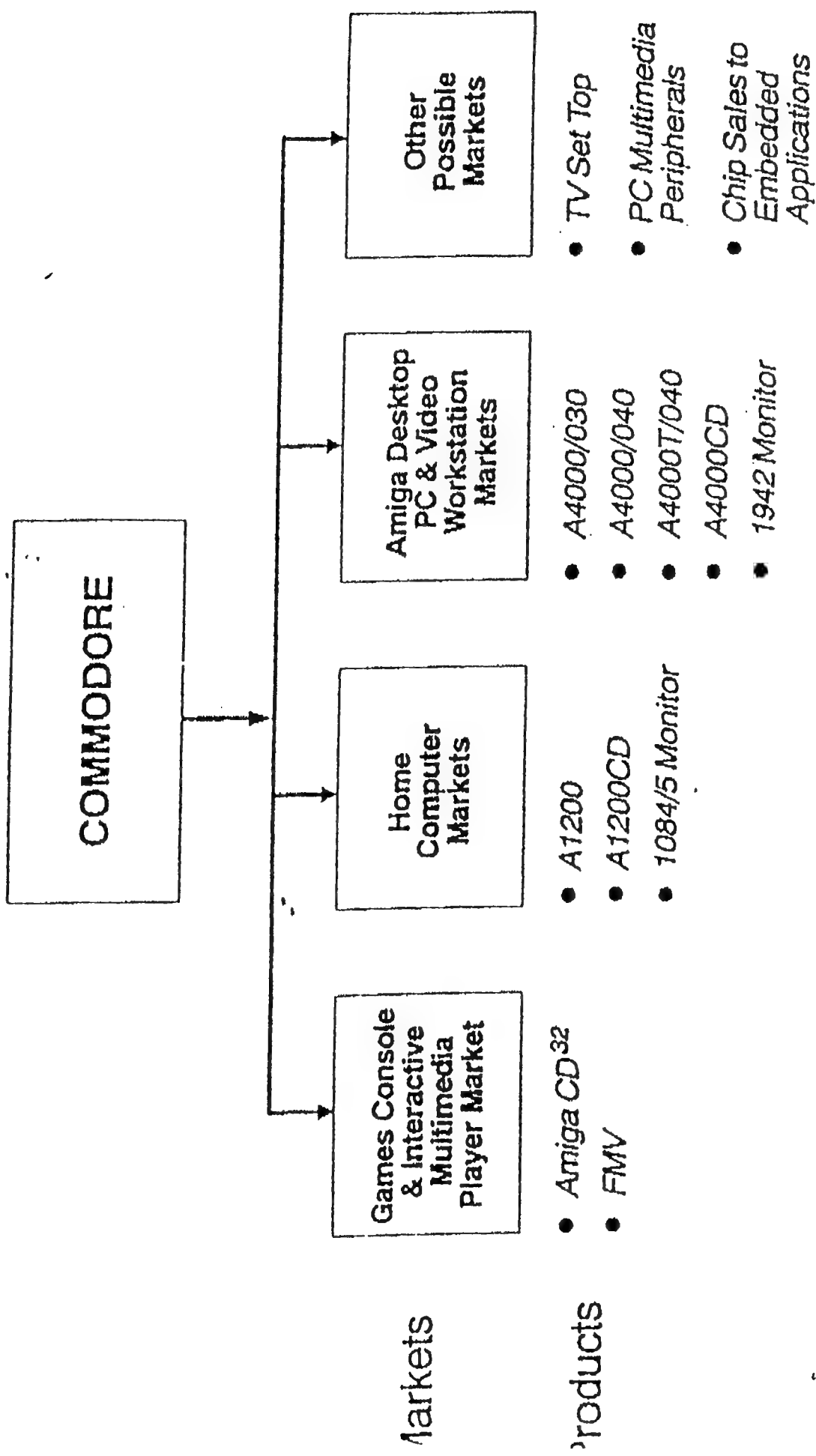
AMIGA HOME COMPUTER MARKETS & PRODUCTS

- PRIMARILY EUROPEAN PRODUCT & MARKET
 - 43% MARKET SHARE
 - > 400K UNITS / YEAR SALES
- FILLS GAP BETWEEN LOW COST GAMES CONSOLES & LOW COST IBM & APPLE PC PRODUCTS
- APPEALS TO BUYER WHO WANT MORE THAN JUST A GAME CONSOLE BUT NOT THE EXPENSE OF A FULL PC
- NEW A1200 SYSTEM IS VERY COST COMPETITIVE:
 - \$399 RETAIL
 - FULL 32 BIT MULTIMEDIA SYSTEM
 - 2MB OF RAM
 - OUTSTANDING GRAPHICS & AUDIO
 - BUILT IN WINDOWING OPERATING SYSTEM
- LATEST TECHNOLOGY
 - NEW LOW COST 32 BIT MULTIMEDIA CHIPSET
 - LESS THAN \$15 COST
 - MOTOROLA 32 BIT 68EC020 PROCESSOR
- LARGE FAMILY OF LOW COST ENTERTAINMENT AND HOME PRODUCTIVITY SOFTWARE
- VERY ACTIVE 3rd PARTY HARDWARE & SOFTWARE DEVELOPERS COMMUNITY
- EXCELLENT PERIPHERAL ADD ON MARKETS
 - 1084 MONITORS (200K/YR.)
 - A1200CD CD-ROM DRIVE (100-200K/YR.)

A1200 COMPETITION

- **A1200 HAS NO DIRECT COMPETITION**
- **FITS IN THE GAP BETWEEN GAME CONSOLES AND LOW END PCs**
- **GAP HAS WIDENED AS PC CONFIGURATIONS & PRICING HAS INCREASED**
- **ALTERNATIVE TO GAME MACHINES**
 - **LOW COST SOFTWARE**
 - **BETTER GAMES THAN ON CARTRIDGE**
 - **OVER 3500 TITLES**
 - **ALSO RUNS EDUCATION & HOME PRODUCTIVITY APPS**
 - **EXPANDABLE TO A POWERFUL MULTIMEDIA SYSTEM**
 - **VERY EASY TO LEARN & USE**
- **PARENTS FEEL GOOD ABOUT THIS PURCHASE VS A PURE GAMES MACHINE**
- **IN EUROPE DESIRE TO BE PC COMPATIBLE IS LESS**
 - **HIGHER PC PRICES**
 - **LOWER PENETRATION IN WORK PLACE**
 - **PC "WORK AT HOME" ETHIC LESS IN EUROPE**
- **VERY POPULAR SYSTEM FOR COMPUTER HOBBIES**
- **OFTEN USED FOR HOME VIDEO & MULTIMEDIA PRODUCTION**

COMMODORE MARKETS & PRODUCTS



CD-ROM BASE GAMES CONSOLE MARKET

- AMIGA CD32 (NEW PRODUCT IN FALL OF 1993)
- FULL INTERACTIVE CD-ROM MULTIMEDIA PLAYER
- PRIMARILY FOCUSED ON ENTERTAINMENT SOFTWARE
 - CURRENTLY OVER 60 GAME TITLES
 - 142 ACTIVE DEVELOPERS
- SUPPORTS MPEG-1 FULL MOTION VIDEO
- SUPPORTS PHILIPS DIGITAL VIDEO STD
- SUPPORTS VIDEO CD & KARAOKE STD.
- VERY LOW COST (\$399 WITH 4 SOFTWARE TITLES)
- NEW HIGH PERFORMANCE 32 BIT TECHNOLOGY
 - RATED BETTER THAN 3DO, ATARI JAGUAR & CD-I
 - USES NEW LOW COST 32 BIT AMIGA CHIPSET
 - LOW COST 2X SPEED MULTI SESSION CD DRV
- BEST SUPPORTED DEVELOPMENT ENVIRONMENT IN THE INDUSTRY WITH COMPATIBLE A4000 SYSTEMS
- 38% MARKET SHARE OF CD-ROM SALES IN UK
- ALSO FULL FEATURED INTERACTIVE MULTIMEDIA PLAYER:
 - AUDIO CDs, CD+G, CDTV APPs, CD32 GAMES
 - PHILIPS DIGITAL VIDEO, VIDEO CD (KARAOKE)
- FULL AMIGA COMPATIBLE COMPUTER MODULE UPGRADE AVAILABLE
- SOFTWARE COMPATIBLE WITH CD-ROM DRIVE FOR THE A1200 HOME COMPUTER SYSTEM

GAME SYSTEM ENHANCEMENT PLANS

Relative Performance	Fall '93	Fall '94	Fall '95
	1x	3x	20x
	CD32	CD32+	CD64-3D
	<ul style="list-style-type: none"> - 68EC020 @ 14 MHz - AA, 4 Chips - 2 MB DRAM - 1 MB ROM - 1 KB NVRAM - 2x Speed CD 	<ul style="list-style-type: none"> - 68EC030 @ 28 MHz - AA, 4 Chips - 2 MB DRAM - 1 MB ROM - 32 KB NVRAM - 2x Speed CD 	<ul style="list-style-type: none"> - PA RISC @ 50 MHz - RISC + 3D, 2 Chips - 2 MB VRAM - 2 MB ROM - 32 KB NVRAM - 4x Speed CD - FMV In Software
Options	Options	Options	Options
- FMV Module	- FMV Module	- FMV Module	- I/O Exp. Module
	- I/O Exp. Module	- I/O Exp. Module	- Computer Module
	- Computer Module	- Computer Module	- Keyboard
	- Keyboard	- Keyboard	- Mouse
	- Mouse	- Mouse	- Modem / IR Control
	- Modem / IR Control	- Modem / IR Control	- Joystick
	- Joystick	- Joystick	- VR Devices
	- VR Devices	- VR Devices	

AMIGA HIGH END SYSTEMS & MARKET SEGMENT

□ PC "LIKE" DESKTOP AND TOWER SYSTEMS

- • Amiga AA 32-bit Chipset
- 68030, 68040 and 68060 MPUs
- Proprietary "Zorro" Expansion Bus Slots
- Standard AmigaDOS Operating System
- STD 1.76 MB Floppy Disk Drive
- Multiple Drive Bays 3.5" / 5.25"

5

□ PRODUCT APPLICATIONS VARY BETWEEN US AND EUROPEAN MARKETS

- US Is - 40% of Market
- US Is Mainly High End (68040 and Towers)
- 70% of US Market Is with Newtek Video Toaster
- Primary Application Is Video Production, Image Processing, and Graphic Arts
 - Niche Market
 - High Penetration
 - Small But Expanding Market
- Systems Outputs Studio-Quality TV Signals without Add-Ons
- Exceptional 3rd Party Software Tools for Video
- Many 3rd Party Add-On Hardware Features

○ — Graphic Boards

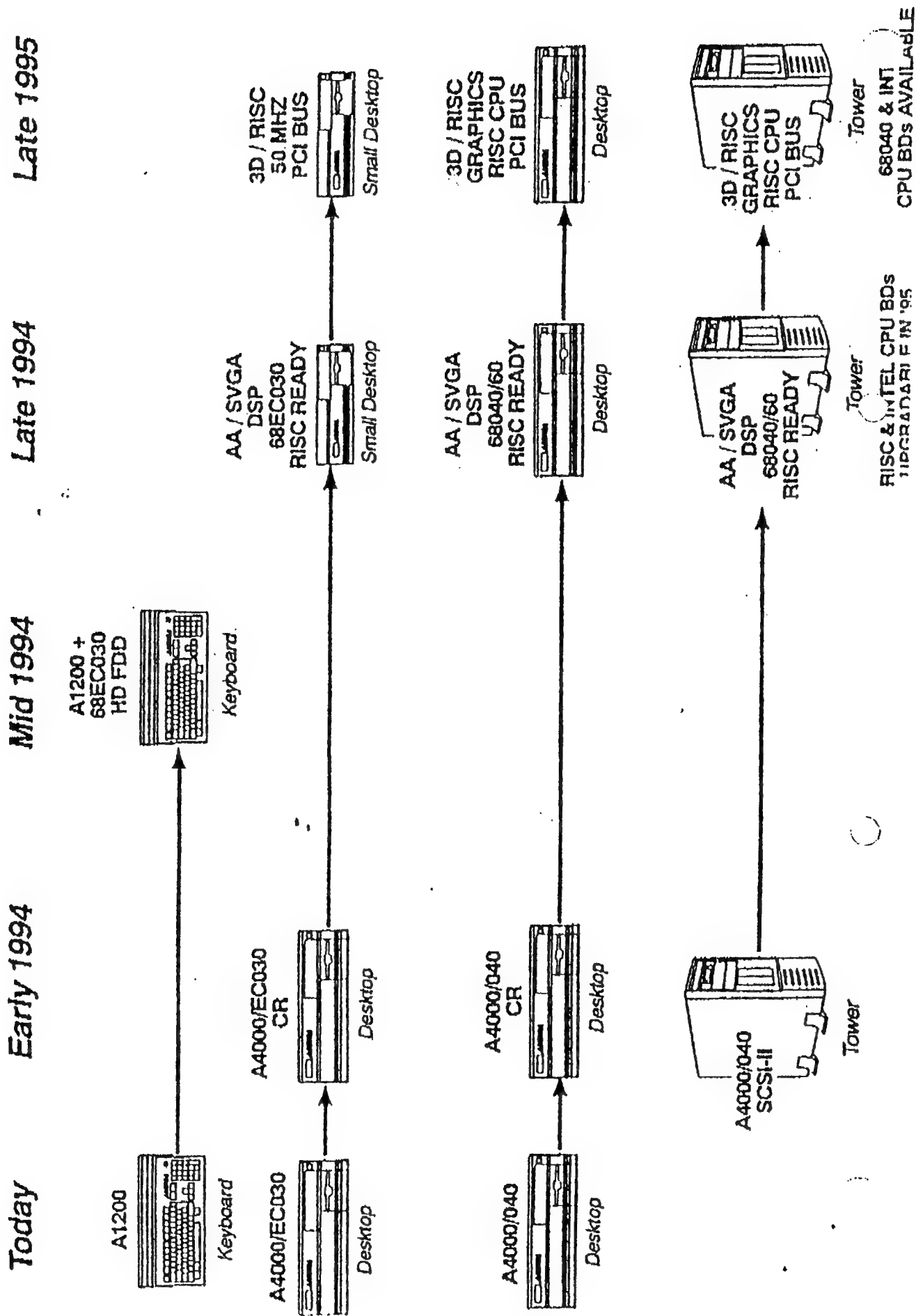
Sound Boards

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1084 MONITORS (10K/yr.)
100000 CD ROM DRIVE (100-200K/yr.)

AMIGA SYSTEMS PLANS



COMMODORE TECHNOLOGY FOR TV SET-TOPS

PROVEN "TV" CHIP SET TECHNOLOGY

- #1 Home Computer in Europe (43% MKT share)
 - Over 5,000,000 installed
 - Over 1,000,000 shipped per year
- #1 CD-ROM Game Console in Europe (38% MKT share)
 - 100K sold
 - Over 100 CD titles
 - Outsold SEGA and 3DO 4 To 1 !
- #1 Market position in CCTV, KIOSKS, INFORMATION
DISPLAY APPLICATIONS IN EUROPE
 - NEW 32 Bit Video Technology
 - Independent Technical review rate AMIGA CD32
 - Superior to: - CD-I
 - 3DO
 - Atari Jaguar
 - Scaleable Capabilities
 - Programmable Rasters & Resolution
 - Programmable color depth & Memory Allocation
 - Low Cost
 - 68ECO20 32 BIT CPU < \$7
 - Chipset Cost < \$13
 - Single Chip with Integrated CPU Feasible
 - 2x Performance
 - 1/2 Cost

COMMODORE TECHNOLOGY FOR

TV SET-TOPS

POWERFUL AMIGA DOS OPERATING SYSTEM

- Preemptive, Multi-tasking, Real-time OS
- Very Stable (8th Major Release)
- Small Memory Requirement
- Operates on All 68xxx Family
- Romable
- Supports, Via Graphics Lib, TV to SVGA Screens
- Runtime Support for 17 Languages
- Inter process messaging, High Level Language (A-Rexx)
- GUI Designed for TV's
- Extensive Device Support
 - FDD's
 - HDD's
 - SCSI devices
 - Networking / LANs
 - PCMICA cards
 - Photo CD
 - CD-ROM
 - IR, Mouse, Joy Pad
- Outline Font Engine
- Object Orientated Audio, Video, Animation Display and Playback
- 1/2 Size of Modular Windows, 5x the Performance

COMMODORE TECHNOLOGY FOR TV SET-TOPS

MOST ADVANCED "STATE OF THE ART" TV / MULTIMEDIA DEVELOPMENT ENVIRONMENT & TOOL SET IN THE INDUSTRY

- Paint / Draw packages
- Image Processing
- 3-D Rendering
- Special Effects Packages
- Titling & Captioning
- Video Capture
- Multimedia Authoring Packages
- High Performance Interactive Script Languages
- Presentation Packages
- Non Linear Editing Systems
- MPEG Players / Encoders
- Assemblers / Linker
- Editor
- Compilers
- Debuggers
- Simulators

KEY COMMODORE TECHNOLOGIES

☐ AMIGA CHIPSETS

- ECS, AA
- NEXT GENERATIONS: AA+, AAA, RISC/3D

☐ AMIGADOS

- MULTITASKING, REALTIME OS
- GRAPHICAL USER INTERFACE
- STABLE 5th GENERATION
- SMALL MEMORY REQUIREMENTS

☐ MULTIMEDIA AUTHORIZING TOOLS

- AMIGAVISION
- CD-ROM SUPPORT TOOLS
- FMV ENCODING TOOLS
- LARGE FAMILY OF 3rd PARTY TOOLS

☐ CD-ROM TECHNOLOGY

- LOW COST DRIVE MECHANISM
- PROPRIETARY MICRO CODE

☐ DSP TECHNOLOGY

- DSP HARDWARE ADAPTER
- AMIGA-BASED DSP DEVELOPMENT TOOLS

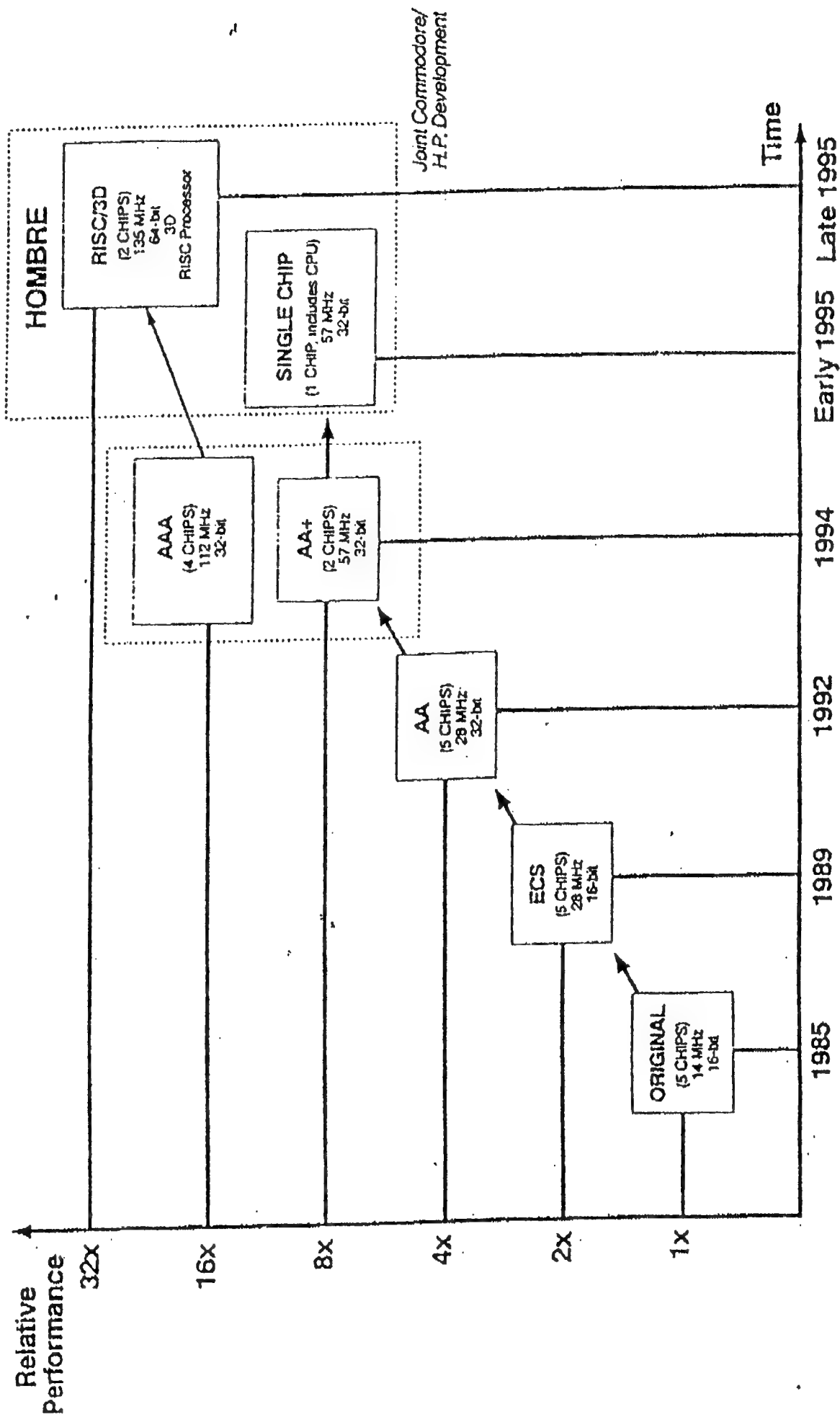
☐ FULL MOTION VIDEO TECHNOLOGY

- HARDWARE & SOFTWARE ENCODERS & DECODERS

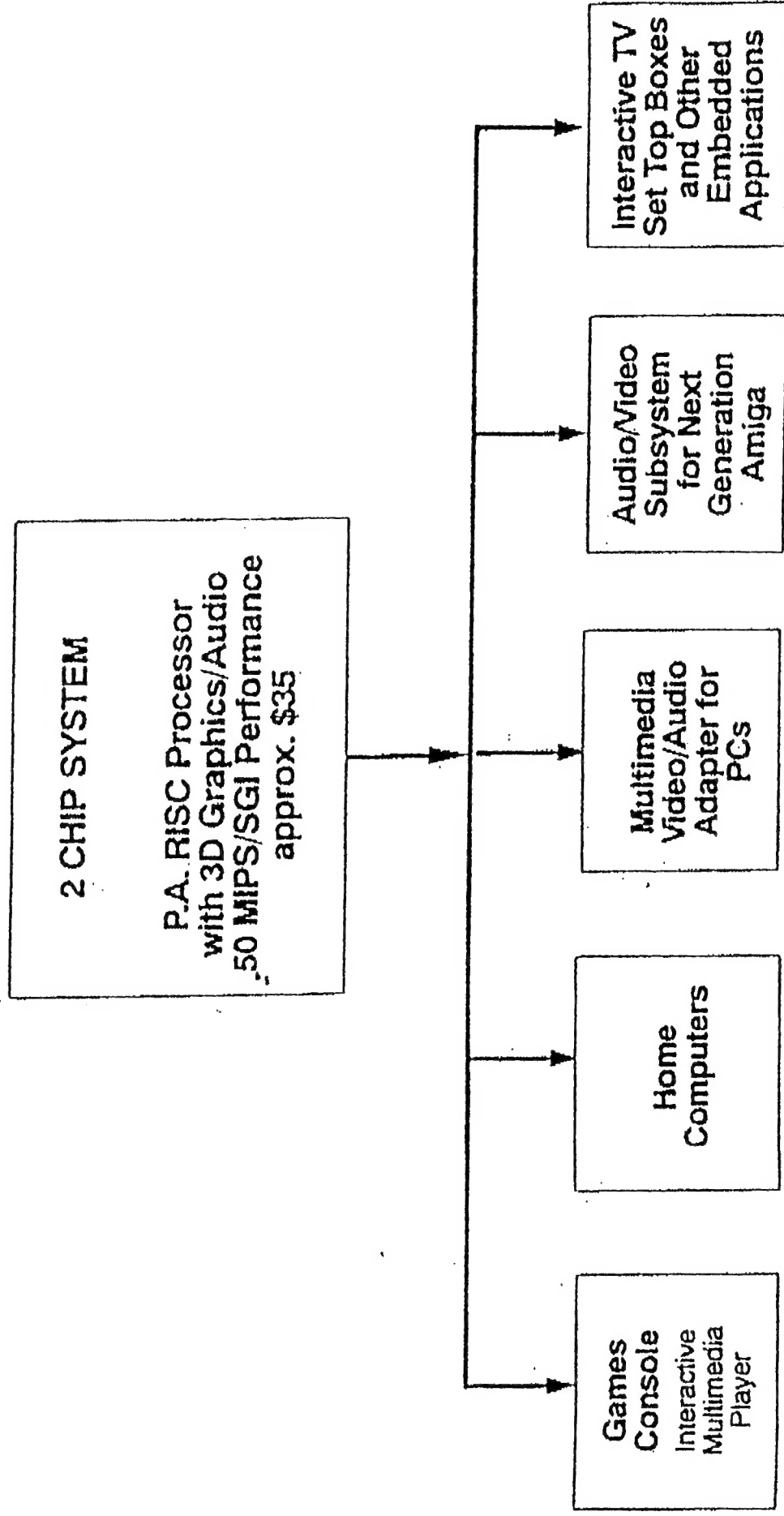
AMIGA TECHNOLOGY APPLICATIONS

- ☐ MULTIMEDIA HOME COMPUTER
- ☐ MULTIMEDIA WORKSTATION
- ☐ MULTIMEDIA AUTHORIZING SYSTEMS
- ☐ CONSUMER INTERACTIVE MULTIMEDIA DEVICES, i.e., GAMES CONSOLE
- ☐ HOME DESKTOP VIDEO PRODUCTION
- ☐ PROFESSIONAL VIDEO PRODUCTION
- ☐ VIDEO PRESENTATION
- ☐ EMBEDDED APPLICATIONS
 - CLOSED CIRCUIT CABLE TV SYSTEMS
 - INTEGRATED VIDEO EDITING IN VCRs/ CAMCORDERS/TVs
 - STANDALONE VIDEO EDITING EQUIPMENT
 - FULL MOTION DIGITAL VIDEO PLAYERS
 - INTERACTIVE CABLE TV BOXES
 - INTERACTIVE SATELLITE TV BOXES

HARDWARE TECHNOLOGY HISTORY/PLAN



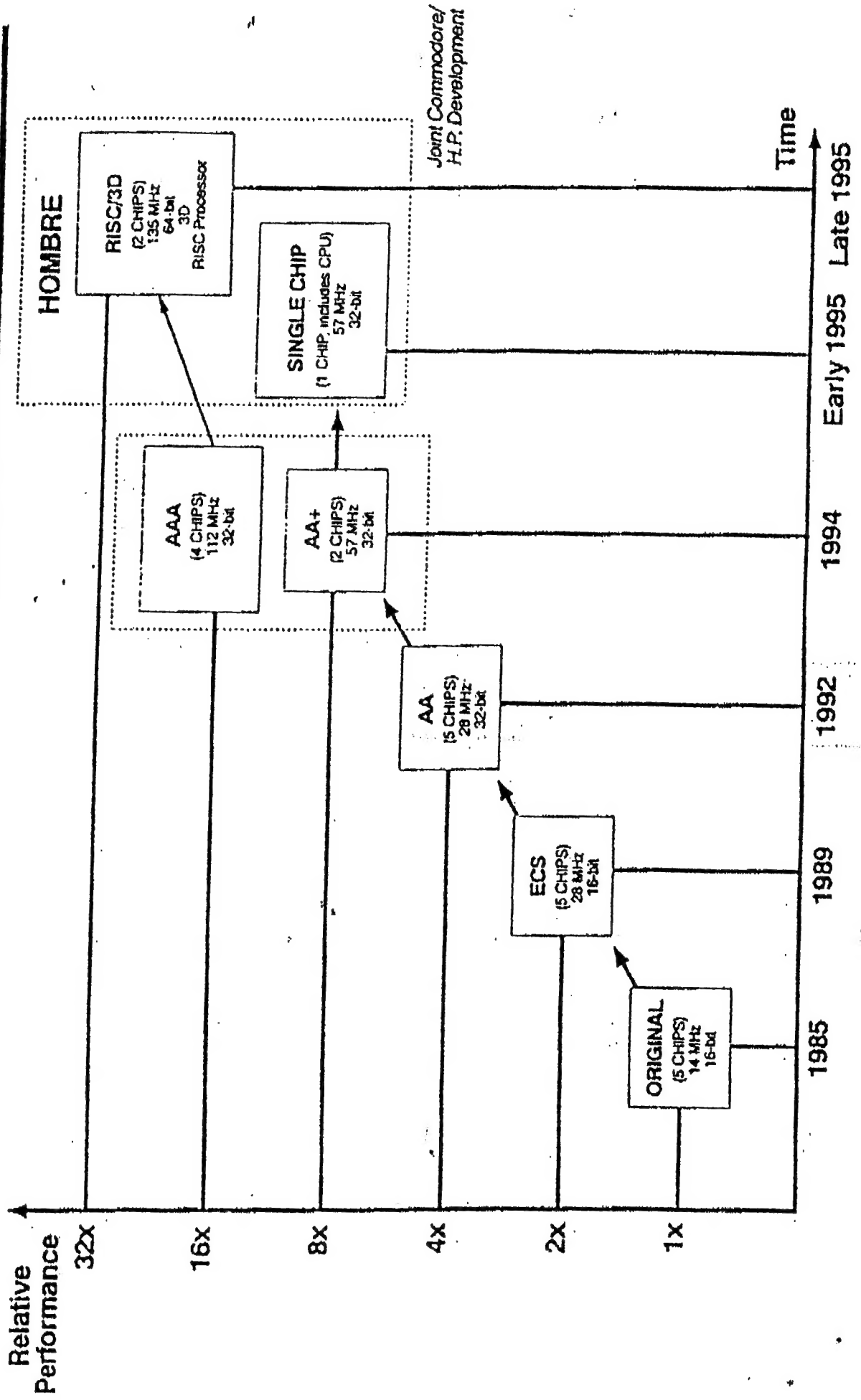
RISC-BASED 3D VIDEO CHIPSET APPLICATIONS



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 - STANDALONE VIDEO EDITING EQUIPMENT
 - FULL MOTION DIGITAL VIDEO PLAYERS
 - INTERACTIVE CABLE TV BOXES
 - INTERACTIVE SATELLITE TV BOXES
 - HOME ENTERTAINMENT CONTROL CENTERS

HARDWARE TECHNOLOGY HISTORY/PLAN



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